DOCUMENT RESUME

ED 317 149 HE 023 370

AUTHOR	Frances, Carol
TITLE	What Factors Affect College Tuition? A Guide to the Facts and Issues.
INSTITUTION	American Association of State Colleges and Universities, Washington, D.C.
SPONS AGENCY	American Association of Community and Junior Colleges, Washington, D.C.; American Association of Univ. Professors, Washington, D.C.; American Federation of Teachers, Washington, D.C.; Association of Urban Universities.
REPORT NO	ISBN-0-88044-117-8
PUB DATE	90
NOTE	71p.
AVAILABLE FROM	AASCU Publications, One Dupont Circle, Suite 700, Washington, DC 20036.
PUB TYPE	Reports - Research/Technical (143) -- Statistical Data (110)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Costs; *Educational Finance; *Educational Trends; Higher Education; *Inflation (Economics); Models; Salaries; State Aid; Student Costs; Student Financial Aid; *Trend Analysis; *Tuition

ABSTRACT

This report analyzes both the trends in college tuition paid by students, and the trends in higher education costs paid by institutions, and offers insights into the relationships between them. Data are presented to show that the annual rate of increase in college tuition has dropped significantly since the early 1980s. A four-factor model is presented to explain upward and downward pressures in total college tuition revenues; the model includes changes in enrollment, costs, share of total costs covered by student tuition, and resources invested. The report examines the legitimacy of comparing trends in college tuition with the Consumer Price Index and the Higher Education Price Index. The report then discusses: (1) the costs of particular goods and services purchased by colleges and universities; (2) trends in faculty and staff salaries and efforts to hold down compensation costs; (3) state higher education appropriations; (4) shortfalls in federal student aid funding; and (5) shortfalls in funding for research. The final two chapters fit tuition into the larger picture of college and university finance and analyze the outlook for college costs and college tuition in the 1990s. Forty-six charts illustrate the findings and are documented in the appendix by tables of data. (JDD)

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What Factors Affect College Tuition? A Guide to the Facts and Issues

By Carol Frances

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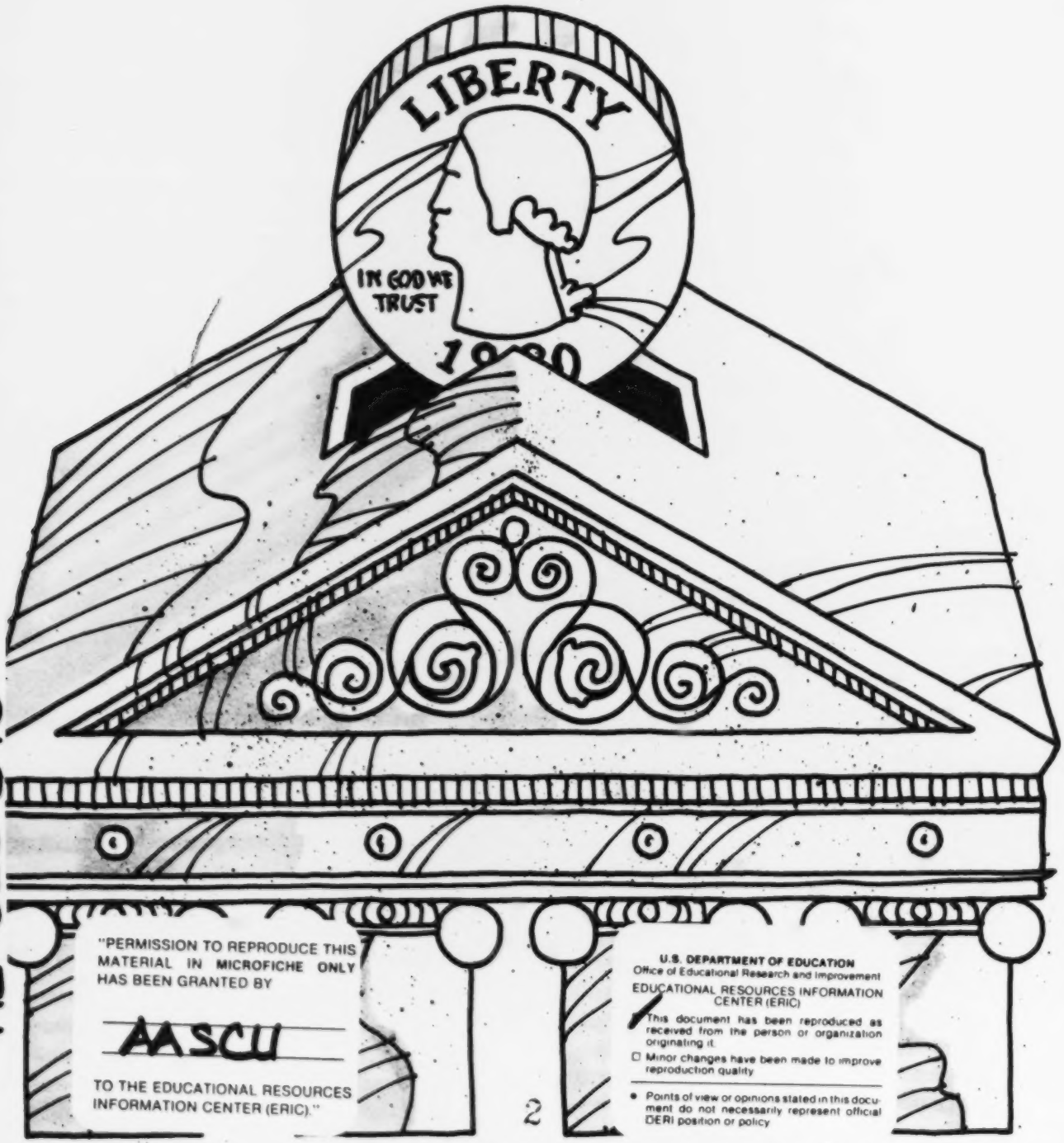

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American Association of State Colleges and Universities

What Factors Affect College Tuition?

A Guide to the Facts and Issues

Carol Frances

Commissioned By:
American Association of State Colleges and Universities

Cosponsored By:
American Association of Community and Junior Colleges
American Association of University Professors
American Federation of Teachers
Association of Urban Universities

Published and Distributed by:
American Association of State Colleges and Universities

Acknowledgments

I am greatly indebted to my colleagues in the higher education associations who asked the difficult questions that set me on this analytical task, questions about the connections between college tuitions that students pay and the costs that institutions incur. They have reviewed earlier drafts and posed still more questions.

A large number of reviewers provided added insights, including Nathan Dickmeyer, financial vice-president at Columbia Teachers' College, as well as other members of the Financial Management Committee of the National Association of College and University Business Officers; Hirschel Kasper, chairman of the Committee on the Economic Status of the Profession of the American Association of University Professors; and Hayden Smith, senior vice-president of the Council for Aid to Education.

As I gathered information to try to answer the questions, Norman Brandt and Vance Grant at the National Center for Education Statistics responded to every request for the latest available data, often providing valuable additional interpretation of the trends.

Joanne Erickson, director of publications for AASCU, was very helpful in clarifying the arguments and improving the presentation of the data in the graphs.

James Caplan, my partner in the firm of Performance, provided a huge extra measure of analytic and computer support.

Marshall Van Alstyne, my son, who is pursuing his MBA at MIT's Sloan School of Management, and Allyn Van Alstyne, my older daughter, with Sanwa Bank in San Francisco, provided incisive technical review of the analysis and draft report. Lisa Van Alstyne, my younger daughter, now at University of California, Los Angeles, helped strengthen underlying arguments by challenging conventional propositions.

Tammy Hall, my administrative assistant, was extremely diligent in preparing the charts and the word processing. People who have worked with me before realize she ultimately produced the final draft by announcing that I could not make any more additions.

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Library of Congress Cataloging-in-Publication Data

Frances, Carol.
What factors affect college tuition? : a guide to the facts and issues / Carol Frances.
p. cm.
ISBN 0-88044-117-8
1. College costs--United States--Evaluation. 2. Universities and colleges--United States--Finance--Evaluation. I. American Association of State Colleges and Universities. II. Title.
LB2342.F68 1989 89-38638
378.3'8'0973--dc20 CIP

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Introduction

This summer, as in most recent summers, alarming headlines announced the coming year's college tuition increases. The press conferences, editorials, and "if this goes on" think-pieces about how much it will cost to go to college in the year 2000 continue to abound.

And rightly so. The cost of education, clearly one of our most vital social functions, is a proper cause for concern. But perhaps not for panic.

The rate of increase in college tuition has slowed dramatically since it peaked in academic year 1981-82. The slowdown is significant enough to make many of the recent college cost studies out of date and consequently, seriously misleading as a basis for management or public-policy decisions. Therefore, it is vitally important to focus our attention on the most recent data and assess their implications for the future.

This study was commissioned by several higher education associations to analyze both the trends in college tuition, paid by students, and the trends in higher education costs, paid by institutions, with some new insights into the relationships between them. It presents facts and highlights issues. It is intended to provide information useful to the people who are paying the bills, to the people who make policy decisions affecting the financing of education, and to journalists who report on education to the interested public.

This study updates and expands two earlier studies commissioned by four higher education associations in the spring of 1987: one on trends in the ability to pay for college, and the other on college finances.

This report focuses on the facts about trends in college costs and college tuition. The report is intended to be a ready reference for anybody who needs information on these topics; therefore, all the charts illustrating findings are documented in the appendix by specially prepared tables of data.

The report attempts to put concerns about costs and tuition into a broader context, including trends in the availability of student aid as they affect students' ability to pay for college. The report consequently includes a substantial amount of data on environmental trends that affect higher education costs and tuition.

The report also tries to shed new light on two important questions: first, at the beginning of the report, on what factors account for tuition increases; and second, at the end of the report, on how tuition fits together with nontuition revenues in overall college and university finance. At the core of these two separate analyses are two simple models that are illustrated by conceptual frameworks and calculations.

Discussion of different rationales for setting tuition policies is planned for a separate report.

Concern About High Tuition

The groups sponsoring this study are deeply concerned about college costs and the difficulties students have in paying for college.

Although the rate of tuition increase has slowed in recent years, tuition has reached high levels at many institutions. Paying for college is a serious concern for students and their families because during the 1980s increases in tuition have considerably outstripped increases in the income to cover the costs, and student grants do not make up the difference.

Many students face serious financial difficulties, as evidenced by the huge increases in student borrowing and the decline in enrollment of some population groups, particularly African Americans.

The sharp drop in the rate of increase in tuition over the last several years is a hopeful sign, however. If the rate of increase in tuition can be pushed below the rate of increase in income and in student aid, then in the future it may be easier for students to pay for college without taking on still greater levels of debt.

Executive Summary

The Facts

•The rate of increase in college tuition has slowed dramatically since it peaked in academic year 1981-82.
•Since 1981-82, the rate of tuition increase has slowed markedly at private colleges and universities, and it has slowed even more substantially at public institutions.
•The rate of increase in college tuition has not come down as fast as did that of the Consumer Price Index (CPI).

The Explanations

•Large tuition increases in the early 1980s resulted from soaring costs of instruction.
•The reason the rate of increase in tuition did not come down as fast as the CPI is, partly, that students are paying a larger *share* of the costs of their education.

In the public sector, for instance, close to 30 percent of the added tuition revenue from 1982 to 1987 is accounted for by increases in the share of education costs borne by students.
•Simple comparisons between the rate of increase in tuition and in the CPI are misleading because tuition is driven up not only by increases in underlying costs, but also by shortfalls in the nontuition revenues of the colleges.

To balance their annual operating budgets, colleges have to ensure that tuition revenues plus nontuition revenues cover their costs. Colleges generally have more control over tuition revenues than nontuition revenues; therefore, when nontuition revenues do not keep up with costs, tuition revenues must be increased to make up for the shortfall.

This is what has happened since 1981-82. Though the rate of increase in the underlying costs that colleges pay has slowed, the share of those costs covered by nontuition revenues has declined. Consequently, the *share* of the costs covered by tuition revenues has increased, which drives tuition up faster than the costs reflected in the price indexes.

• Another difference between costs in higher education and costs measured by the CPI is the way productivity is taken into account. Productivity in higher education is generally reflected in greater knowledge gained by students, not in fewer inputs and lower costs of production as it is for manufactured goods in the CPI.
• The reasonableness of the explanation that tuition is going up faster than costs because nontuition revenues are going up more slowly than costs depends, in turn, on the reasonableness of those costs.

Although some people are now talking about the need for cost containment in higher education, the rate of increase in costs from 1982 to 1989 was actually lower than the rate of increase from 1975 to 1982.
• Though there have been compensatory increases in faculty salaries in the 1980s, partially making up for earlier losses to inflation, in terms of real income, the faculty are currently *below* the income levels reached in the early 1970s. Their compensation compares unfavorably with that of other professionals who in the 1980s have exceeded their earlier income levels.
• Federal student grant programs would have to be virtually twice the level they are today to reach the same level of purchasing power they had in academic year 1980-81.
• Increases in institutionally funded student aid, to compensate for shortfalls in federal student financial aid, may be responsible for as much as 25 percent of the increase in tuition at some institutions.
• Shifts of students out of lower-cost fields of study, such as education, into higher-cost fields, such as business and computer science, are adding to college cost pressures.
• Other cost pressures stem from the expenses of administering student financial aid programs, recruitment, administrative costs, employment taxes, and costs of socially mandated programs such as those requiring access to facilities for handicapped students.
• New technology has brought requirements for new investment in facilities and equipment, and increased the amount of borrowing and debt service,

some of which may increase cost pressures in current operating budgets.

• While federal funding for research has increased substantially, it has not increased as fast as college and university expenditures for research. During the peak years in the 1960s, there was $8.90 in federal funds for research for every dollar invested by the institutions. By 1987-88 the amount had dropped by more than half, to $3.45.

• To understand the source and direction of financial pressures in higher education—and the consequent pressures to increase tuition—it is important to look at both expenditures and revenues that can be associated with particular functions.

In the first half of the 1980s, discretionary expenditures —for such functions as institutionally funded student aid —added to the overall financial pressures experienced by colleges and universities and added to the pressures to increase tuition.

In contrast, in the last half of the 1970s, discretionary revenues relieved financial pressures and enabled colleges and universities to hold down rates of increase in tuition.

Public and Private Choices Affecting the Outlook for College Tuition in the 1990s

• The outlook for college costs and tuition levels in the 1990s depends not only on economic conditions but also on management decisions and public-policy choices.

•In the economic domain, the outlook will be affected by the federal budget deficit and federal student aid funding, state support, inflation, the demand for college education, trends in the ability to pay for college, and the willingness to borrow.

Even unfunded pension liabilities of large numbers of state university retirement systems will force state budget choices between resources for the present and resources for the future.

• Demographics will also play a role in increasing pressures on state education budgets. There will be a large increase in the number of school-age children in the first half of the 1990s, which will require large increases in funding for elementary and secondary education. This will put pressure on state budgets for higher education, which will translate into pressures to increase tuition at public colleges and universities.

• In the management domain, future tuition levels will be influenced by long-standing tuition policies, current market forces, the level of commitment to greater educational opportunity, quality competition among institutions, investment in research, commitments to public service, competition with industry for faculty, and—most significant—faculty salaries.

• In the 1990s, college costs and tuition levels will be determined not only by economic trends outside the control of colleges and universities, but also by educational, social, and political choices that the institutions themselves, and the public and private agencies that provide their funding, make.

This study is intended to help focus attention on these choices.

1

The Facts

Tuition Costs Paid by Students

The annual rate of increase in college tuition has dropped significantly since the early 1980s. The year-to-year rates of increase in tuition in both the public and the private sectors of higher education peaked at over 12 percent in academic year 1981-82. Since then, the rates of tuition increase have slowed in the private sector to around 8 percent and declined even more dramatically in the public sector to around 5 percent.

This significant drop in the rate of increase of tuition since the early 1980s is shown in Chart 1.

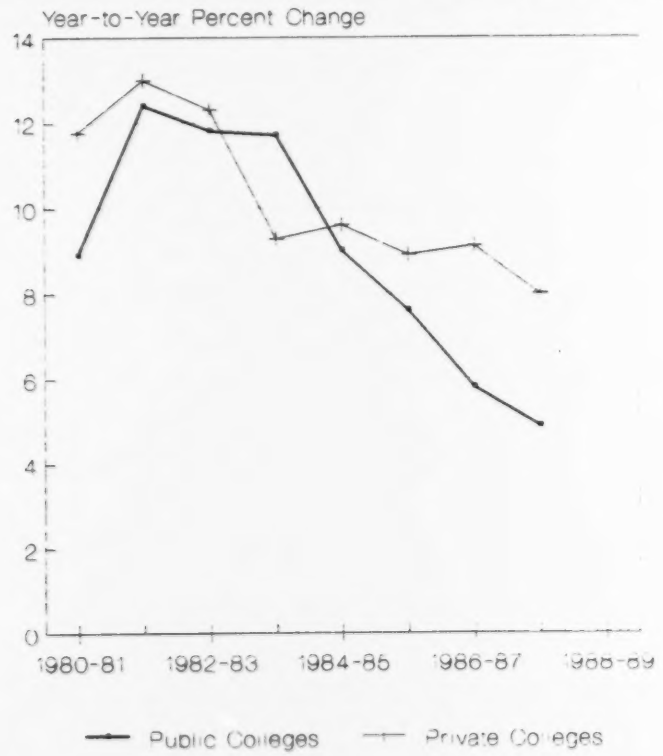
The Questions

Two important questions need to be answered:
1. Why did tuition go up so fast in the early 1980s?
2. Why have tuition increases slowed down so much since then?

There is a follow-up to the second question:
3. What haven't tuition increases slowed down even more, and come down as fast as the consumer price index did?

And finally:
4. What are the prospects for tuition trends in the 1990s?

Chart 1
Trends in the Rate of Increase in College Tuition



Source: National Center for Education Statistics (NCES)

2

Analyzing the Trends

Conceptual Framework For Analyzing Factors that Contribute to Tuition Increases

In analyzing trends in college tuition and in college costs it is useful to have a model, or conceptual framework, that links the explanatory factors together and that facilitates measurement of the relative importance of the different factors in contributing to spending pressures.

A good way to start building the conceptual framework is to look at the four major categories of factors that contribute to pressures on colleges and universities to increase spending—which then translate into pressures to increase tuition.

A step-by-step explanation for the increases in total college tuition revenues, from a base fiscal year to a later one, could proceed like this:

Starting with:
Education costs in the base year
Pressures to increase (decrease) spending are the result of:

1. Increases (decreases) in enrollment
   +
2. Increases (decreases) in costs
   +
3. Increases (decreases) in the share of total costs covered by student tuition, and
   +
4. Increases (decreases) in resources invested:
   Changes in the quality of existing programs
   New educational programs
   Changes in productivity
   Changes in institutionally funded aid
   =

Net change over the base year levels of spending

This basic four-factor model can be used to explain pressures to increase or decrease total spending and to increase or decrease total tuition revenues. It can also be used to examine the differences in the weights attributed to each factor by public and private colleges, and differences in the weights over different time periods—noting, of course, that the weights are affected by the sequence in which they are measured, while logic may suggest the reasonableness of the order presented. The model is depicted on Chart 2.

Time Frame

There are several basic considerations in analyzing trends in tuition and in costs that are not always taken into account—though they should be.

First, selecting the right time frame for the analysis is important because different beginning or ending dates for periods being compared can affect conclusions—or even reverse them.

Second, identifying the points in time when tuition trends change direction is useful because it helps in firming up possible explanations for the findings through comparing patterns of change in tuition and in possible causal factors.

And third, putting the recent tuition trends into a much longer-term perspective, covering several decades, is important because some of the reasons for increases in tuition in the early 1980s are found in conditions that had been building up since the 1960s and 1970s.

To help determine the appropriate time periods to compare in this analysis, the year-to-year increases in tuition were computed for the last 10 years for which data were available, as shown on Chart 3. The chart clearly indicates that these 10 years encompass two quite different time periods: the first, from 1977-78 to 1981-82, when tuition increases were accelerating; and the second, from 1981-82 to 1987-88, when tuition increases were decelerating. Thus, the academic year 1981-82 breaks recent tuition history into two very different time periods because it marks the turning point at which tuition increases began to slow down.

Comparing and contrasting the two different periods (or periods as close to them as possible depending on the availability of data) is helpful in understanding recent tuition trends.

Presentation of the Data

Average Annual Rate of Change versus Year-to-Year Change

The choice made about the way to present data on the rate of increase in tuition can make significant differences in identifying the trends and in formulating the issues.

One way of presenting the data is to show the average annual rate of change over some period of time. The draft of one study reports, for instance, that "from 1980 to 1987, tuition and fees increased at an average annual rate of nearly 10 percent." Such a statement could be illustrated as on Chart 4. No particular justification is offered about why the appropriate period for the analysis is 1980 to 1987. And the use of the average annual rate of change overlooks important information available by looking directly at the year-to-year rates of change.

Looking at an average annual rate of tuition increase of "nearly 10 percent" from 1980-87 as shown in Chart 4 results in a quite different perception of what is going on than does an examination of year-to-year rates of change as shown on Chart 3. The year-to-year data give a much clearer picture of the actual trends, especially of changes in the *direction* of the trends.

In fact, while the average annual tuition increase of just over 10 percent from 1978 to 1982 is almost exactly the same as the average annual tuition increase from 1982 to 1988, the actual year-to-year trends move in the opposite direction—with tuition increases sharply *accelerating* in the first period and sharply *decelerating* in the second, as shown on Charts 5 and 6 (for private colleges, for example).

Chart 2
Factors that Affect Tuition Revenues

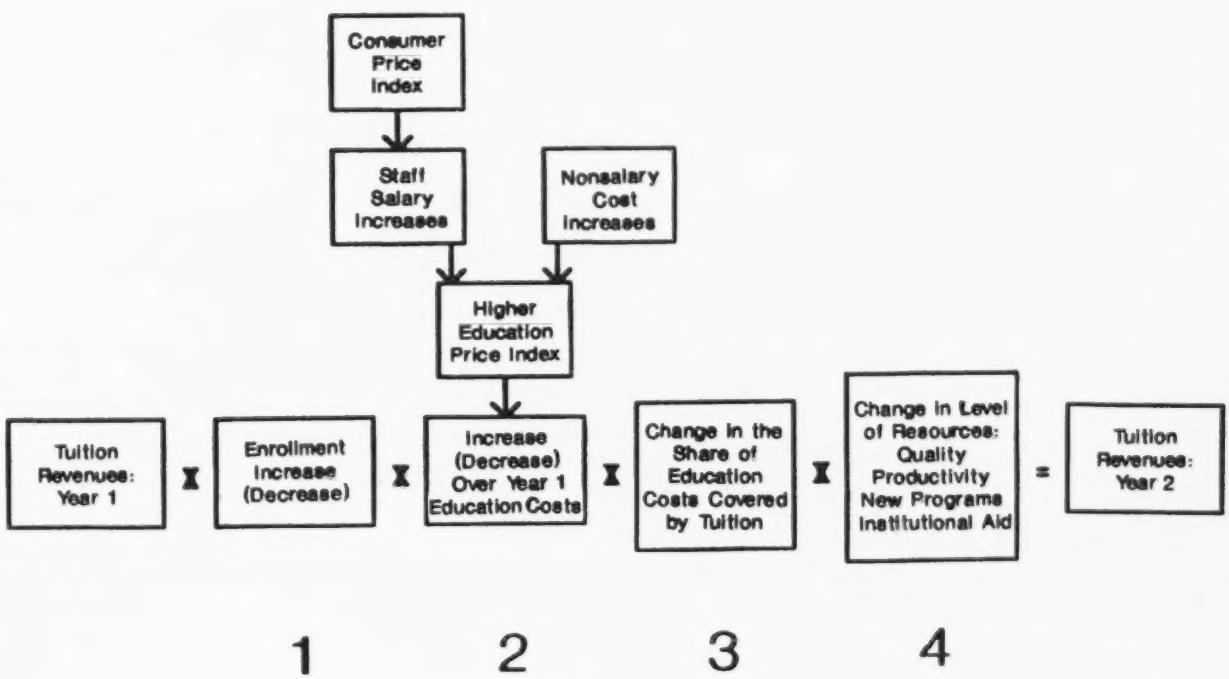


Chart 3
Trends in the Rate of Increase in College Tuition
Year-to-Year Percent Change

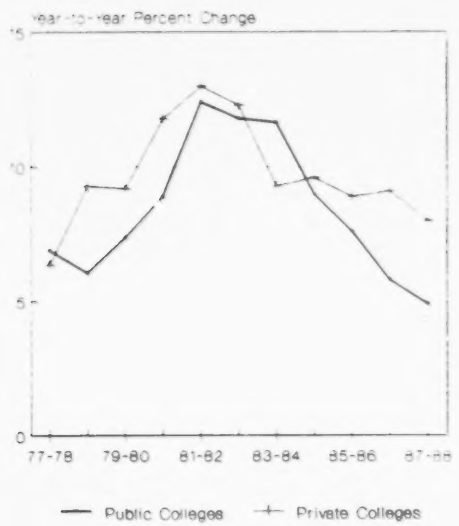
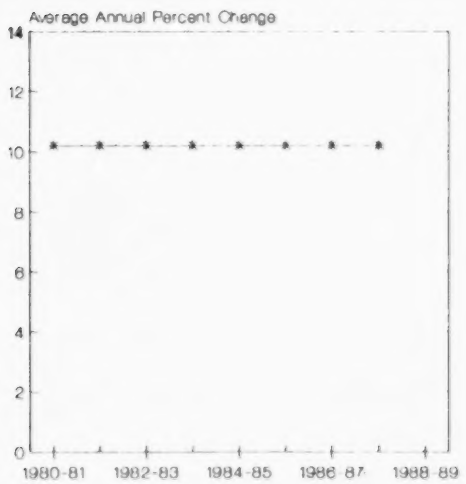


Chart 4
Trends in the Rate of Increase in College Tuition
Average Annual Percent Change



Source: NCES

Chart 5
Trends in Tuition:
Private Colleges and Universities,
1977-78 to 1981-82

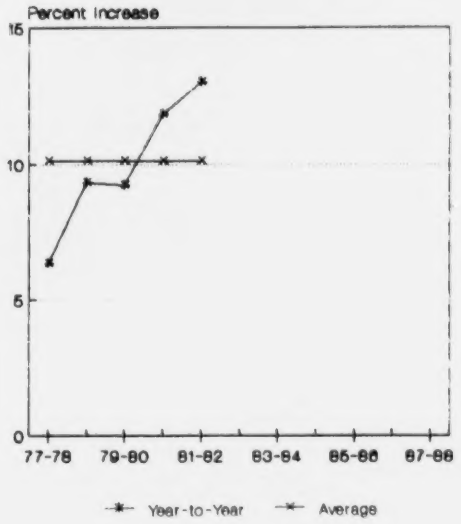
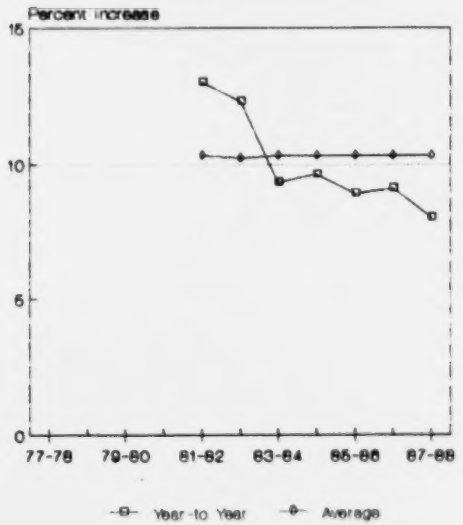


Chart 6
Trends in Tuition:
Private Colleges and Universities,
1981-82 to 1987-88



Source: NCES

3

Factors Contributing to Tuition Revenue Increases

The four-factor conceptual framework—the framework that encompasses the major factors that contribute to pressures on colleges to increase spending, which is depicted in Chart 2—is used to compare the different financial environments in which tuition revenues were collected and spent over two different time periods. It is also used to calculate the percentage share of the increase in total revenues that would have been accounted for by each of the four factors.

It should be stressed that this framework characterizes the financial environment in which colleges would have operated *if* resources had been allocated in the same way as in the base year, after taking into account inflation and changes in the share of costs covered by tuition.

From 1975-76 to 1980-81 in the public sector, 73 percent of the increase in tuition revenues would have been needed to cover increased costs to purchase the *same* amount of resources as were invested in educating each student in the base year; and 23 percent would have been needed to cover the cost of *additional* resources per student. Thus, 96 percent—virtually all—of the increase in tuition revenues could have been accounted for by the two factors: increased costs over the base year for the same purchases and increased investment in educational resources. During the second half of the 1970s, at most institutions the share of the base cost covered by tuition did not increase much, so tuition was not driven up for that reason.

In contrast, in the more recent period from 1980-81 to 1985-86, 29 percent of the increase in tuition revenues in the public sector would have been needed to cover the increase in the *share* of the base year costs covered by student tuition—and little would have been left to invest in additional resources per student. In this financial environment, the colleges and universities in actuality had to generate those additional resources for program improvements and innovations by cutting costs or generating revenues from other sources.

This framework can now be used to help explain an important difference between the two time periods being compared. Over the first time period, from the mid-1970s to the early 1980s, tuition increased at about the same rate as costs. In the second period, from the early 1980s to the mid-1980s, the rate of increase in tuition dropped significantly—but not as much as did the rate of increase in the underlying costs. In the second period, however, tuition was increased to cover a larger share of the costs in response to shortfalls in revenues from other sources.

The differences between the two periods in the share of the increase in tuition revenues accounted for by each of the four factors can be summarized as follows:

	Public Institutions Percentage Share of the Tuition Revenue Increase	
	1975-76 to 1980-81	1980-81 to 1985-86
Factor:		
Total Increase in Tuition Revenue	100.0	100.0
1. Enrollment Increase	3.1	0.6
2. Inflation Increase	73.4	66.1
3. Tuition Share Increase	1.9	29.0
4. Resource per Student Increase	21.6	4.3

The difference between the two time periods becomes even clearer by comparing trends in tuition, the CPI, and the HEPI, as done in the next chapter.

4

Comparative Trends: College Tuition, HEPI, and CPI

Trends in college tuition are often compared with trends in the CPI. The comparison is misleading, however, because the CPI does not consist of purchases weighted to represent what the students, or the colleges, buy.

There is, however, an indirect linkage between the CPI, the HEPI, and college tuition. The linkage is as follows. First, the cost of living is an important factor in negotiating faculty and staff salary increases, so the CPI is important in driving salaries. Second, personnel compensation constitutes more than three-quarters of the spending base in the HEPI, so faculty salaries are important in driving HEPI. Third, higher education cost increases play a significant role in driving tuition increases.

During the period of accelerating tuition increases in the late 1970s and early 1980s, these relationships held fairly well. The CPI increased about 9 percent per year, and faculty and staff salaries increased at almost the same rate, as shown by the solid bars in Chart 7 representing average annual rates of change from 1978 to 1982. However, nonsalary costs increased faster than personnel compensation, driving the HEPI to a rate of increase almost as high as the CPI. Tuition increases during that period were held at about the rate of increase in the HEPI.

These basic relationships have not held up over more recent years. Since the early 1980s, tuition has been increasing at much faster rates than the CPI. But the wrong questions are being asked. People wonder why college costs keep escalating. And some people even talk about cost containment.

But costs are not continuing to escalate. The rate of increase in the underlying costs of higher education institutions has actually slowed down markedly. In fact, the average rate of increase in the HEPI for 1982 to 1986 is substantially below the rate for 1978 to 1982, as shown in Chart 7.

The rate of increase of the CPI since 1982 has dropped to less than half the rate from 1978 to 1982. Faculty salary increases are currently greater than the CPI to compensate for losses by the faculty in real income from 1971 to 1982. But the faculty salary increases since 1982 are still *lower* than they were from 1978 to 1982. And the rate of increase in nonsalary costs has declined precipitously, primarily because the rate of increase in energy costs has dropped. Thus, the HEPI was increasing at only about two-thirds of the rate tuition was increasing. More recently, the rate of increase in HEPI and tuition have moved closer together.

Why Haven't Tuition Increases Slowed Even More?

Thus, although tuition increases are slowing down, the real question is, Why haven't they slowed even more, in light of the fact that inflation in the national economy dropped from over 13 percent in 1980 into the 2-3 percent range in 1986 and 1987, and into the 4-5 percent range in 1988 and 1989, and has moved up only slightly since then? Inflation in higher education itself only moved down to the 4-6 percent range.

Trends in tuition in both the public and the private sectors are compared with trends in the CPI in Chart 8.From 1986-87 to 1987-88 the rate of increase in the CPI moved up from 2.3 percent to 4.1, bringing it close to the 4.5 rate of increase in the HEPI for that year. The upsurge in the CPI in 1987-88 was reflected in the HEPI in the following year, 1988-89, when the HEPI moved back up 6.2 percent.

Tuition is Used to Balance Budgets

One important reason tuition increases have not slowed even more is that tuition is used to balance budgets. When other sources of revenue increase at rates slower than the rates of increase in costs, colleges require students to pay a larger share of the costs of their education.

Increases in the share of education costs covered by tuition are keeping the rates of tuition increase much higher than they would otherwise be. As explained above, in the public sector, almost 30 percent of the increase in tuition revenues from 1980-81 through 1985-86 can be accounted for by increases in the *share* of education costs covered by tuition. Increases in the *share* of costs covered by tuition also played a role in raising private college

tuitions higher than they would otherwise have been during this period.

In the late 1970s, the share of the costs of education borne by students in the form of tuition stayed about the same. Thus, the shift factor played practically no role in tuition increases during that earlier period in either the public or the private sector.

Tuition Also Covers Spending Not Measured by the HEPI

The HEPI is constructed using weights for the different expenditures of colleges and universities based on the budget of a research university in 1972.

The components of the HEPI include professional and nonprofessional compensation and fringe benefits, which now account for about 80 percent of the base weights in the index; and contract services, supplies, equipment, books and periodicals, and utilities, which account for the remaining 20 percent.

The index is constructed using fixed weights over a given period of time, as it should be to measure changes in prices. But spending pressures arise not only because of increases in *prices* of particular items but also because of higher *numbers* of items that have to be purchased.

Thus, while the price of one computer may have gone up little or even gone down, institutions must buy many, perhaps hundreds, of additional computers. Similarly, where institutions may have had one lawyer in the 1970s, they may engage many lawyers in the 1980s. Thus, the HEPI measures costs to the colleges, but it does not measure spending pressures, which are transformed into pressures to increase tuitions.

More Pitfalls in Comparing Trends in Tuition with Trends in the CPI

Public officials and people working for the media frequently compare increases in college tuition with increases in the CPI and question why the increases in tuition have been higher than in the CPI. The answer has several parts:

Tuition is Different from Ordinary Consumer Prices

Tuition is not a price like those for other consumer products because it is affected not only by costs of education but also the *share* of those costs borne by students. Tuition is used to balance budgets when there is a shortfall in other sources of revenue.

Tuition paid by students covers only part of the cost of students' education—about one-fifth to one-third at public institutions and about two-thirds to four-fifths at private institutions—while the rest of the cost is met by other public and private sources of revenue. Student tuition charges are thus affected by both the level of education costs and the share of those costs they pay. The arithmetic is explained in the table below. Comparisons between the rates of increase in tuition and in consumer prices can be misleading if this difference is not taken into account. As explained above, shortfalls in revenues from other sources have been an important factor driving up student tuitions.

There are many reasons why overall consumer prices have declined more rapidly than higher education costs through the late 1980s, and why, moving into the early 1990s, the CPI is turning back up at a slower rate than the HEPI.

Differences in Accounting for Increased Productivity

One reason for the difference between the rate of increase in tuition and that in consumer prices is the way productivity is reflected. Increases in productivity in manufactured goods that consumers buy show up in lower prices. Increases in productivity in education are much more difficult to quantify and are more likely to show up, not as lower prices, but as greater value added--that is, as greater output of knowledge produced per unit of educational input.

Why Tuition Keeps Going Up:

1. Cost pressures
2. Spending pressures
3. Revenue shortfalls

Example showing that a small revenue shortfall can result in a large percentage increase in tuition:

	Year 1	Year 2	Percent Increase (Decrease)
Total Expenditures	100	104	4
Total Revenues	100	104	4
Tuition and Fees and Other Private Sources	50	54	8
Federal, State, and Local Sources	50	50	0

Note:: In this example, total expenditures increased by 4 percent from Year 1 to Year 2. Public sources of revenue did not keep up with the cost increases, and tuition increases are used to balance the budget. A 4-percent increase in expenditures was thus accompanied by an 8-percent increase in tuition, though the share of costs borne by the students increased only from 50 percent to 51.9 percent. This example showing the arithmetic is close to what had actually happened to tuition in recent years.

Example showing spending pressures that are reflected in tuition but not in the HEPI

	Year 1	Year 2	Percent Increase (Decrease)
Total Expenditures:	100	104	4
Instruction	50	48	- 4
Academic Support			
Computers	10 10x$1,000	12 15x$800	20
Operation and			
Maintenance	10	10	—
Repair	5	6	20
Utilities	5	4	- 20
Other	30	34	13

Note: In this example, total expenditures increased by 4 percent while the share of expenditures devoted to instruction decreased slightly because of cost pressures elsewhere in the budget. The institution increased its outlays for computers by 20 percent.

Though the cost of an individual computer decreased by 20 percent from $1,000 to 800, the number of computers purchased increased 50 percent from 10 to 15.

The spending pressure for computers increased. The HEPI, constructed with fixed weights as it should be to measure price changes—not volume changes—reflects the *decrease* in the cost of the computer but not the *increase* in spending pressure resulting from purchasing more computers.

Impact of Productivity Increases on Costs in Higher Education

In most industries, increases in worker productivity offset the increases in worker earnings, thus holding down unit cost increases. It has been argued that higher education, because it is labor intensive and does not have the same opportunity industry has for substituting capital for labor, does not have the same potential for productivity increases. Yet competition with industry drives faculty salaries up, resulting in inherently higher rates of cost increase in higher education than in industry.

This may be true, but there is much more to the productivity arguments. First, there is no good measure of productivity in higher education. Productivity is simply a measure of the amount of output per unit of input. Usually, some measure such as student credit hours or degrees is used as a measure of output. Credit hours or degrees are, however, more a measure of inputs, such as student's time, than of outputs.

A meaningful measure of educational output would have to encompass *the amount of knowledge generated or transferred.* Thus, the costs of higher education appear to be increasing faster than they actually are.

For instance, the knowledge gained by students earning an engineering or biology degree in the 1980s is greater than the knowledge that was gained by students who earned a degree in the 1960s. The tuition price of a degree is conventionally figured, however, on the basis of *inputs*—credit hours—and does not reflect any of the increased *outputs*, or gains in productivity, measured in terms of knowledge produced.

Differences in the Treatment of Discounts

Another difference is that the prices in the CPI may reflect industry-wide *discounts*, such as the price of cars net of the "cash back." The CPI, which includes these discount prices, is being compared with the tuitions listed in the college catalogs, without reflecting the widespread discounting that results when the colleges use institutionally funded student aid to reduce the actual net tuition paid by aided students well below the published figure.

Differences in Ability to Import Lower-Priced Substitutes

Still another reason is that increases in the CPI have slowed in the early 1980s as a result of the overvaluation of the U.S. dollar in international markets. The overvalued dollar bought increasing amounts of imported goods at comparatively lower prices than U.S. prices, which slowed the increases in the CPI—and produced the highest trade deficits in U.S. history.

Most of the goods and services colleges and universities buy are produced in the United States ,and foreign-made lower cost imports cannot be substituted easily. In some fields, though, particularly in science and engineering, a small but increasing number of U.S. citizens who leave college teaching are being replaced by foreign nationals—with as yet unascertained consequences for the future of American higher education. In any event, in more recent years, the American dollar decreased in

value in comparison with the currency of its major trading partners, and the CPI has also begun to edge up slightly.

HEPI Lags Behind CPI

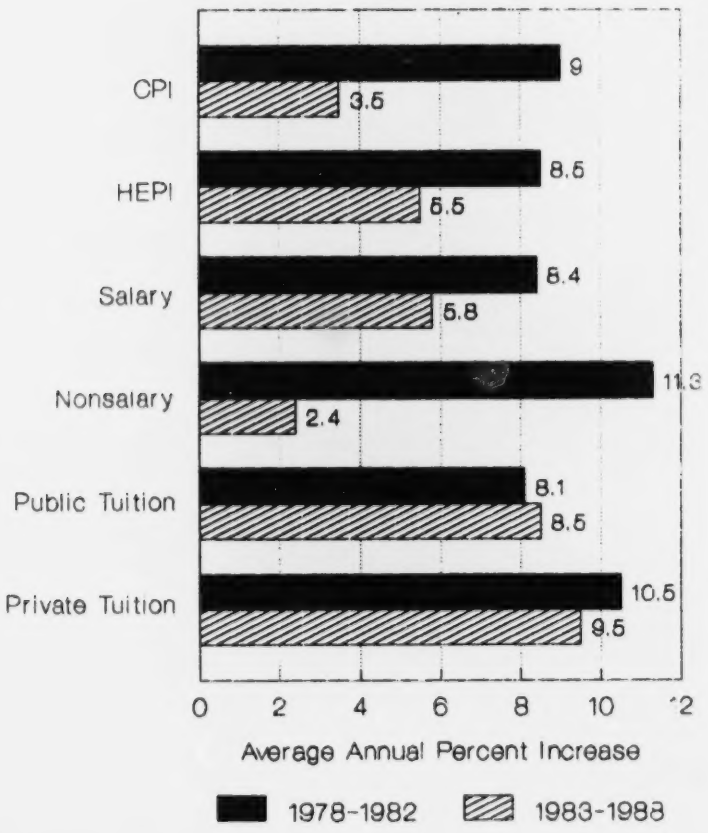
It has been argued that the "natural rate" of inflation in higher education is about one to two percentage points above the CPI. While this may be true, it does not explain why in some years inflation in higher education is below the overall rate.

An axiom that holds up better over more years—though not always—is that the trend in the HEPI lags the CPI by about one year. The reason is straightforward. Salaries are the largest component of higher education operating costs and are set once a year. Faculty and staff salaries are generally set or negotiated with reference to the rate of increase in the cost of living in the previous year.

Consequently, higher education generally lags one year behind the CPI. If the CPI is going up, the lagged HEPI is below the CPI. If the CPI is going down—as it has been in recent years—the lagged HEPI is above the CPI. Chart 9 shows that the HEPI lagged the CPI in the early 1980s, in the usual pattern—but has moved synchronously in the mid-1980s, which has not been the usual pattern in the past.

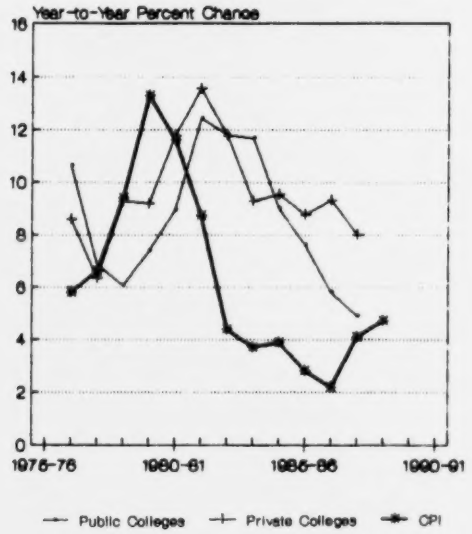
Industry has much more flexibility than do colleges and universities to adjust prices to immediate conditions.

Chart 7
Comparative Trends:
CPI, HEPI, College Tuition



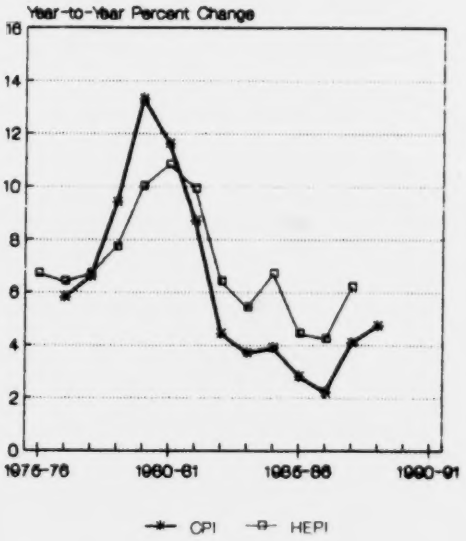
Sources: U.S. Department of Commerce (USDC), U.S. Department of Education (USDE)

Chart 8
Trends in College Tuition Compared with the CPI



Sources: USDC, USDE

Chart 9
Trends in Higher Education Cost Compared with the CPI



Sources: USDC, USDE

5

Trends in Higher Education Costs

This section of the report focuses on higher education costs, examining in greater detail trends in the costs of particular goods and services purchased by colleges and universities.

The best measure that currently exists of trends in higher education costs is the HEPI constructed by Kent Halstead. Personnel costs account for about 80 percent of the weight of HEPI. The other 20 percent is made up of contract services, supplies, equipment, books and periodicals, and utilities.

Every single category of higher education costs increased at a lower rate from 1982 to 1989 than in the previous seven years, as shown on Chart 10. The long-term trends in the compensation costs are shown on Chart 11 and in all the other cost categories on Chart 12. The year-to-year increases are shown on Chart 13.

Percentage Shares of the Total Cost Increase in Higher Education

The share of the total cost increase accounted for by each of the major budget categories depends on two factors: first, the rate of cost increase for the items, and second, the weight of the item in the HEPI.

Over 90 percent of the increase in the HEPI over recent years is accounted for by increases in personnel compensation. The contributions made by the cost components other than personnel compensation dropped from 24 percent over the period from 1977 to 1982 to 8 percent over the period from 1982 to 1987.

In the earlier period, soaring costs that institutions could not control for goods and services purchased from outside sources forced them to hold down increases in costs they could control, which are primarily faculty and staff compensation. In the later period, a slowdown in the rate of increase in uncontrollable costs enabled the institutions to restore some of the purchasing power lost by faculty in earlier years.

The Explanations: Costs Paid by Colleges

Controllable vs. Uncontrollable Costs

Colleges and universities face two quite different kinds of costs: the first is more controllable, the second less controllable—or uncontrollable. The labels of the categories are more distinct than the categories actually are. Organizing detailed cost components into these two different categories of costs is useful, however, in explaining major trends in costs.

The more controllable costs are primarily faculty and staff salaries. Salaries are the largest single cost of colleges and universities, usually constituting two-thirds to four-fifths of current operating budgets. Salaries are "more controllable" because they are generally negotiated within the institutions or between institutions and the state budget-making agencies and/or faculty bargaining units. But even these inside negotiations have to take into account the cost-of living increases, which are outside of the control of the institutions.

The second category of costs is uncontrollable. There are also two different types of uncontrollable costs. One is the prices established in markets outside the control of institutions and they include the amounts paid for utilities, equipment, supplies, books, and periodicals. Although the prices are outside the control of the institutions, spending can be controlled, at least to a limited extent, by controlling the amounts purchased, as through energy conservation measures or cutting the number of books bought.

Another type of uncontrollable cost is the cost of meeting governmentally mandated requirements, such as providing access to facilities for handicapped students, or meeting occupational health and safety standards in research laboratories. In this domain, the institutions do not have a choice of reducing spending by reducing compliance with the requirements.

Cost Pressures

There are additional cost pressures not revealed by looking only at HEPI. They are revealed by looking at the college campuses themselves. These additional cost pressures include:

•*Shifts to High Cost Majors.* One often hears that higher education is slow to change, but the shift of students out of liberal arts and into business and computer science shows that institutions have accommodated an astounding amount of change in a few years. The net change in the numbers of baccalaureate degrees awarded by field from 1979-80 to 1986-87 is shown on Chart 14.

Students are shifting from lower-cost to higher-cost fields of study. These shifts have contributed significantly to cost pressures on college campuses. Students are shifting to high-demand fields, in which institutions have to compete with business and industry to attract and keep professors in teaching. As a result, institutions are having to offer higher salaries in these fields. In addition, science and engineering require huge capital outlays for equipment and laboratories at colleges.

In industry, when demand for a product line slips, the line may be eliminated to hold down production costs. It is not so simple in higher education, however. Often new programs are added or expanded without the option of paring back existing programs. Thus, computer science was expanded while education programs were retained. This contributes to cost pressures.

Yet while demand for education courses has fallen off sharply, in just a few years there is going to be a large increase in the number of school-age children, and a large increase in the demand for teachers. Knowing that, and knowing the long time it takes to teach teachers how to teach teachers, we could be foolhardy to cut costs by eliminating the education programs only to have to rebuild them in a short period.

However, there may be considerable room for more aggressive program review in higher education to determine whether to sustain programs with slackening enrollments in order to reduce costs.

•*Impact of New Technology.* New technology has added enormously to the capital costs of higher education on the administrative side as well as the teaching side. New technology has affected libraries, administrative services, student record keeping, and telecommunications. Not only did colleges and universities have to purchase new computers, but some of them had to rewire the old buildings on campuses to handle the electrical loads.

•*Administrative Costs.* The colleges and universities have been criticized for increases in administrative overhead. While it is true that much of the growth of employment in higher education in the late 1970s and early 1980s was in nonteaching personnel, at least some of these costs resulted from the need to build a staff to administer the student aid programs, to provide additional student services to less well-prepared students, and to solicit funds from private sources as the growth in funding from public sources slowed.

The HEPI is constructed using fixed weights based on expenditure patterns before the sharp growth in spending for administrative costs. Because administrative salaries have generally increased faster than faculty salaries, if the weight for administrative costs were increased, the HEPI would show a greater rate of increase than it does.

•*Costs of Socially Mandated Programs.* Higher education institutions are also subject to the same standards as is industry for occupational health and safety, clean air and water, and access to facilities for the handicapped. These requirements have added to costs of delivering educational services.

•*Social Security Taxes.* In the last five years, the higher education cost category with the highest rate of growth is fringe benefits, as shown on Chart 12. A closer look at fringe benefits yields the conclusion that a large portion of what is labeled "fringe benefits" is actually the social security taxes paid by institutions—that is, the taxes on employment. As the federal government has shifted away from progressive income taxes, more of the revenues are generated by regressive taxes on employment.

This hits colleges and universities particularly hard, because they are relatively labor intensive—compared with modern manufacturing, for instance. Higher education institutions are called "tax exempt," but as nonprofit entities they are exempt from income taxes, *not* employment taxes.

Not all people in higher education are part of the social security system, but for institutions that are, these employment taxes can constitute a huge expenditure. One research university in New York reports, for example, paying $24.5 million in employment taxes in fiscal 1987. Economists argue about whether, in the long run, the employment

taxes are absorbed by the faculty or shifted to the students in higher tuitions, but in the short run, whichever direction they are shifted, they cause financial pressure on academic institutions.

•*Cost of Borrowing.* Colleges and universities have increased their borrowing significantly and have increased their debt-to-physical-asset ratios as well.

The dramatic percentage increase in the amount of debt colleges and universities have assumed since 1980 is shown on Chart 15. While the value of the physical assets of the institutions in terms of land and buildings has been increasing at about the same rates in the 1980s as in the 1970s, and the rate of acquisition of new equipment is somewhat faster, debt is increasing in the 1980s at a rate more than double that of the 1970s.

Generally, capital budgets are separate from operating budgets, but if transfers are required from operating budgets to repay part or all of the debt, then borrowing increases the current costs to the institutions and contributes to overall financial pressures, which could in turn contribute to pressures to increase tuitions.

Chart 10
Trends in Higher Education Costs By Component

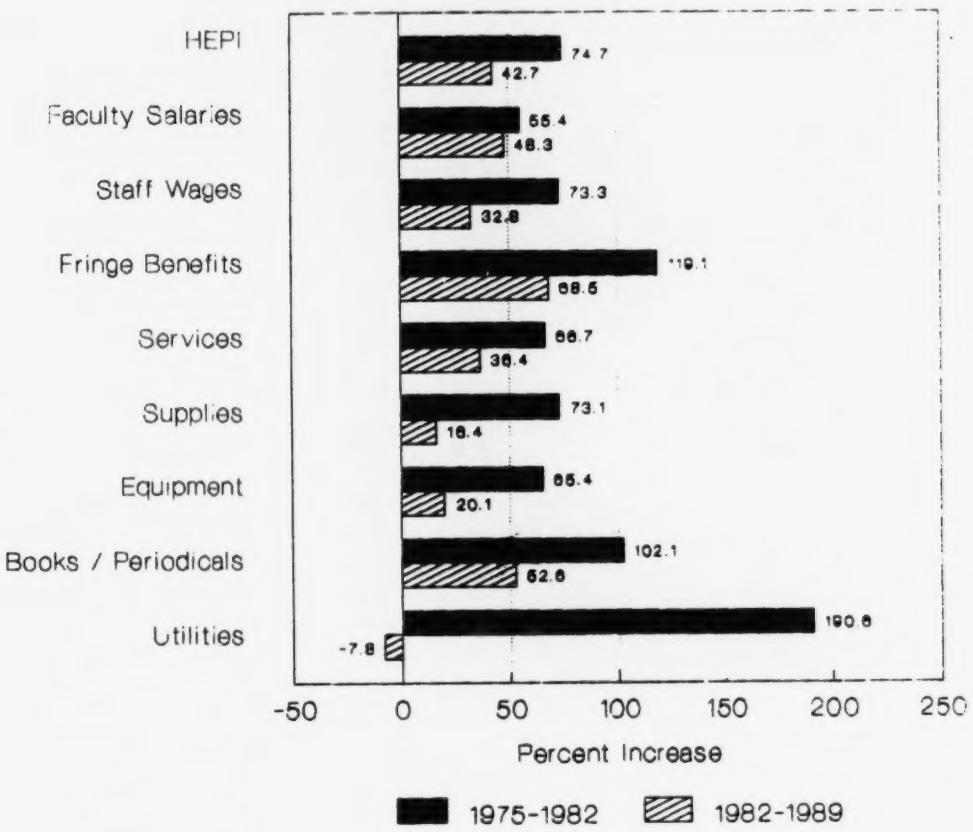
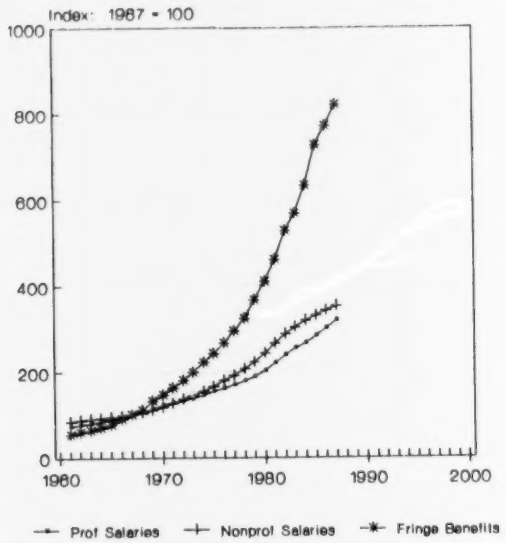
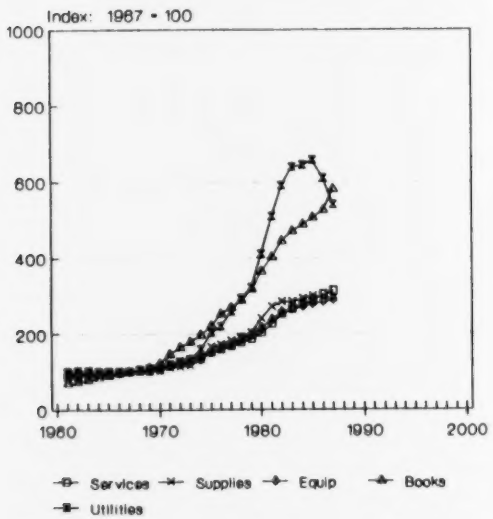


Chart 11
Higher Education Cost Trends:
Personnel Compensation



Source: Research Associates

Chart 12
Higher Education Cost Trends:
Services, Supplies, Equipment, Books and Periodicals, and Utilities



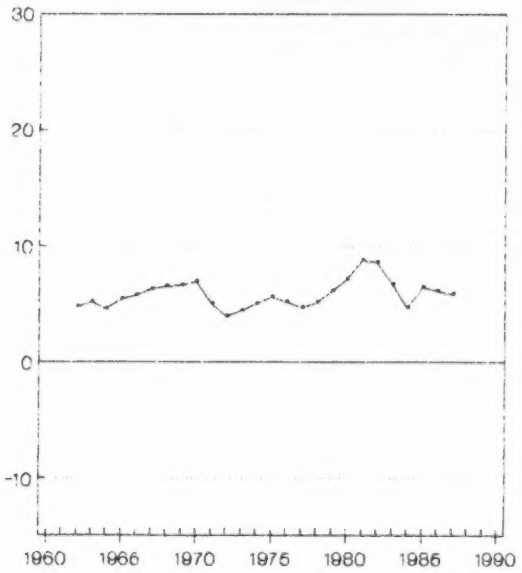
Source: Research Associates

Chart 13

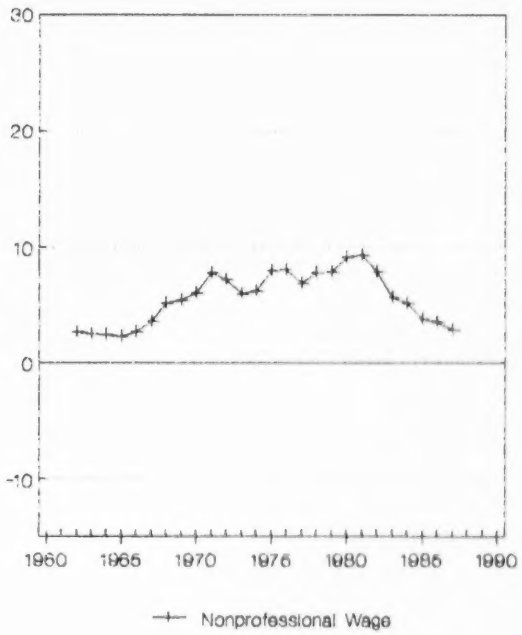
Higher Education Price Index Components

Year-to-Year Percent Changes

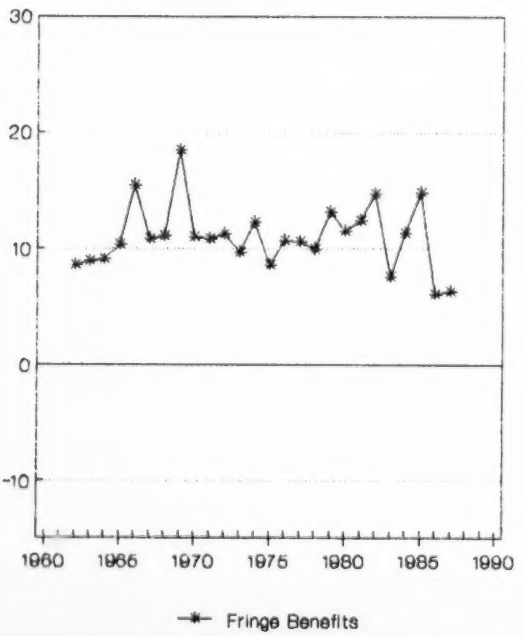
Professional Salaries



Nonprofessional Wages



Fringe Benefits



Contracted Services

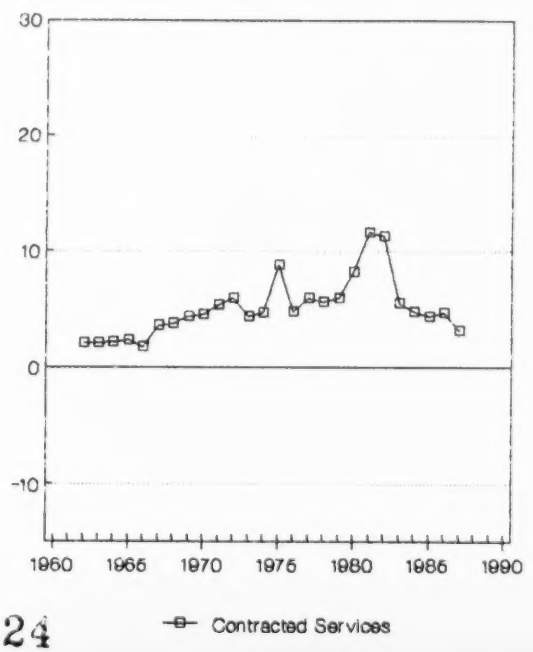
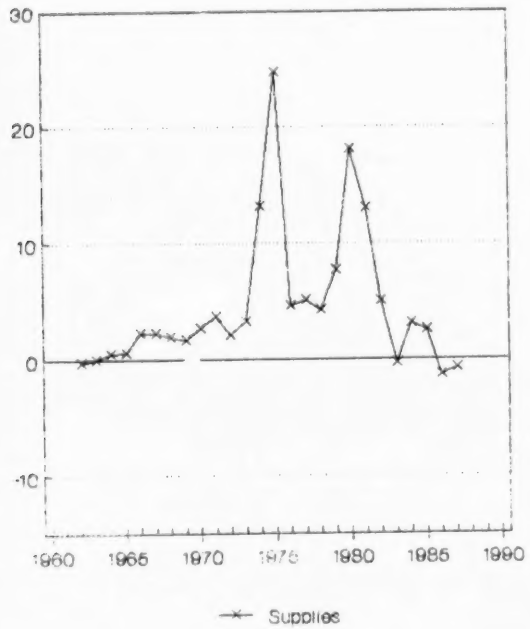
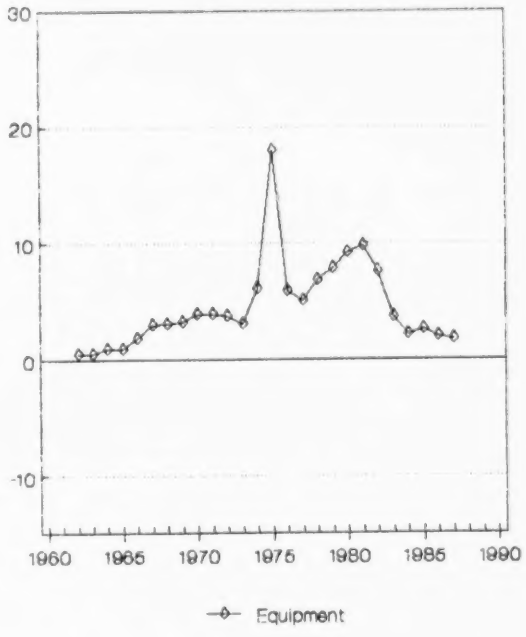


Chart 13
(Continued)

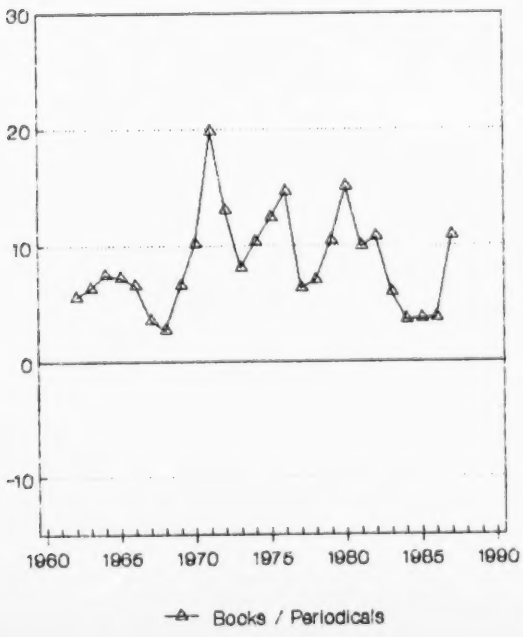
Supplies



Equipment



Books / Periodicals



Utilities

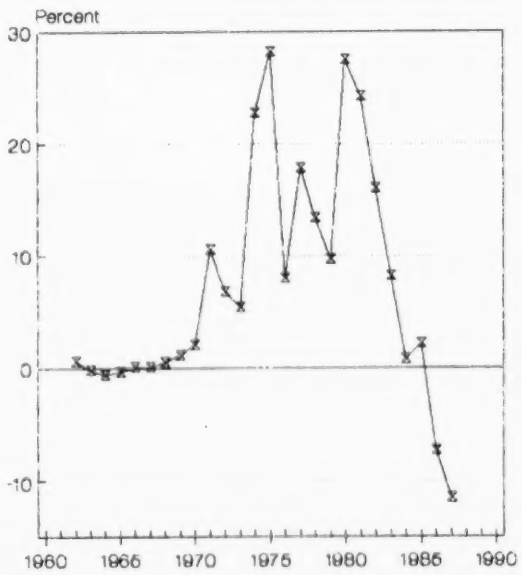
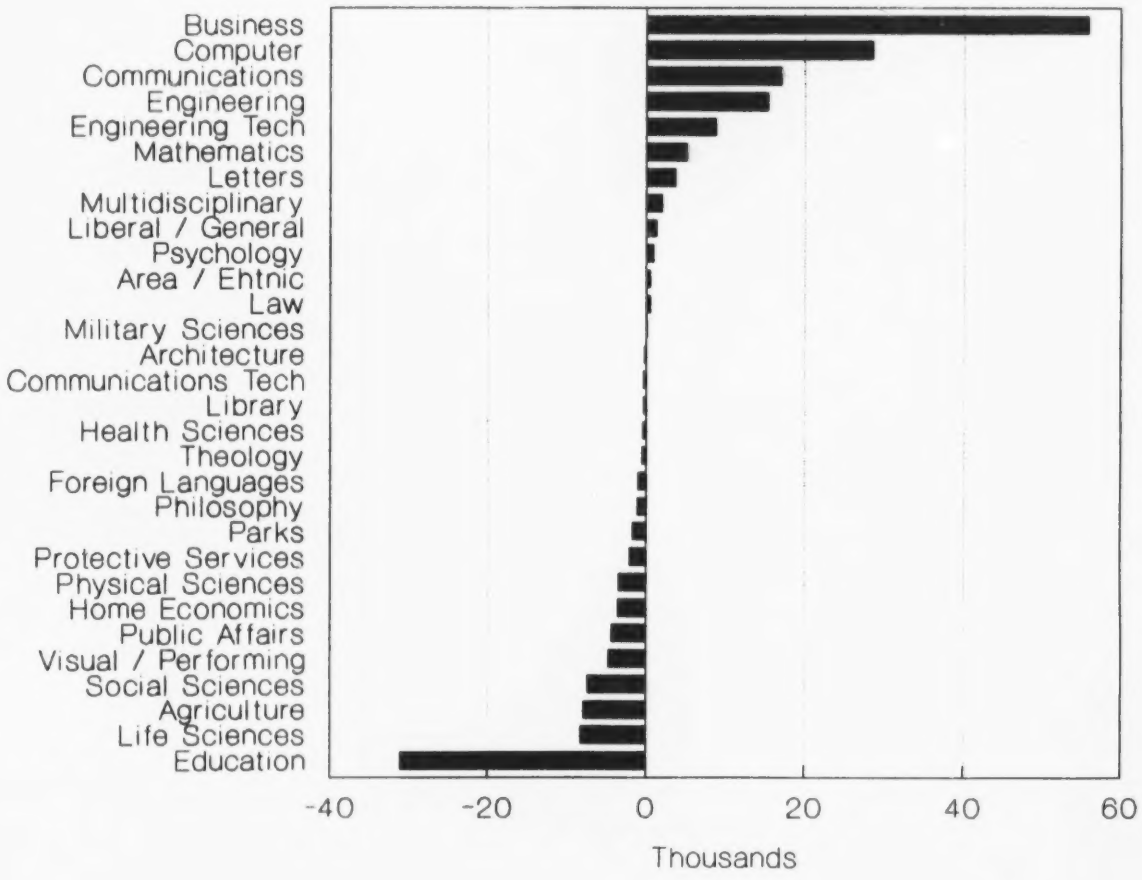


Chart 14

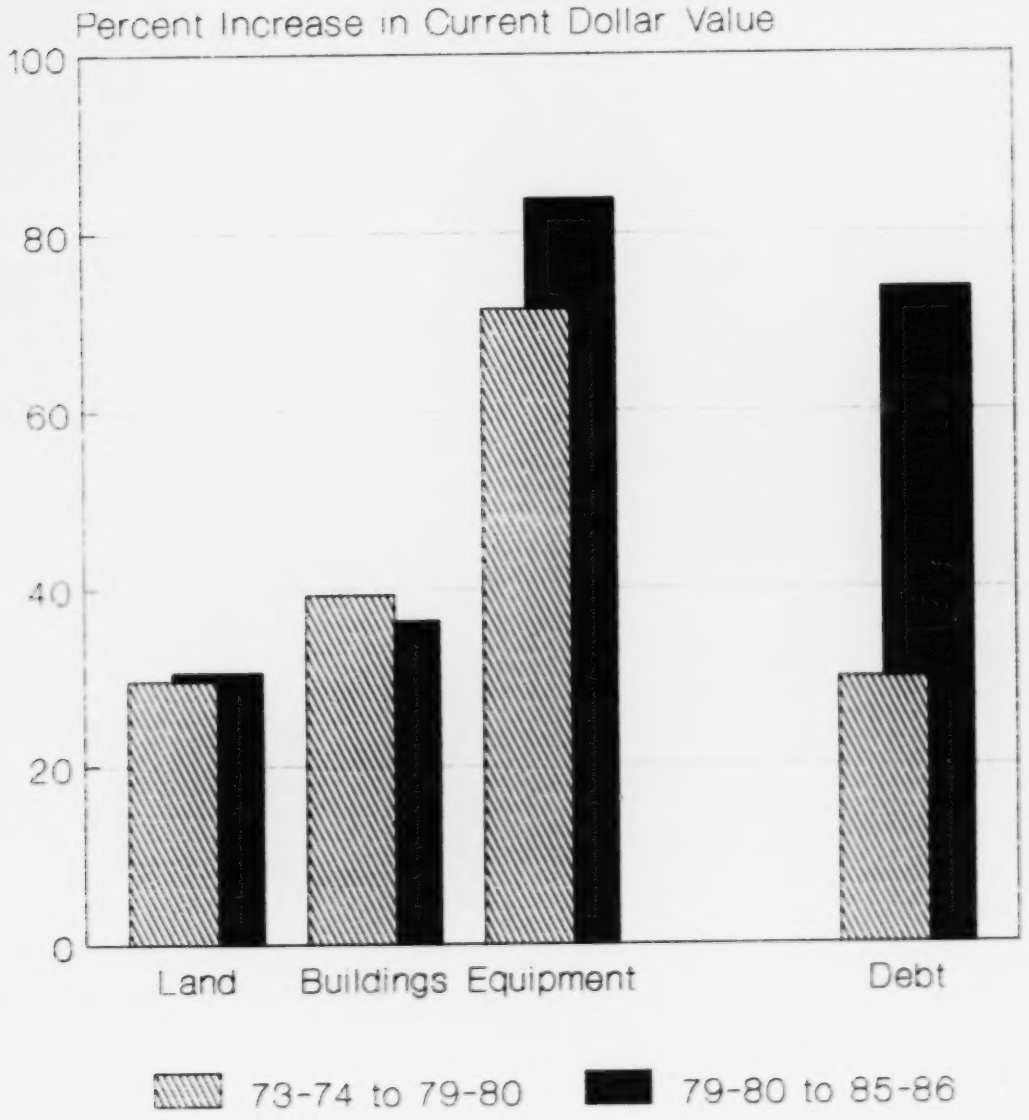
Change in Baccalaureate Degrees

1979-80 to 1986-87



***Source*: USDE**

Chart 15
Trends in Physical Assets and in Debt of Colleges and Universities



Sources: USDE, Office of Educational Research and Improvement (OERI), NCES

6

Trends in Faculty and Staff Salaries

Faculty and staff salaries are by far the largest single component of college and university budgets. Salaries now account for about 80 percent of the HEPI. Consequently, an understanding of cost trends in higher education depends on a careful look at trends in faculty and staff salaries.

During the 1960s, faculty gained significantly in real income because annual increases in salaries were larger than increases in the cost of living. Then, from 1971 to 1982, *all* of the real gains in faculty income were wiped out, because in 11 of these 12 years the cost of living increased more than faculty salaries. Thus, by the early 1980s, in terms of real income, faculty salaries were about at the level of the 1960s.

The annual percentage increases in faculty salaries since 1961 compared with the annual increase in the CPI is depicted on Chart 16, and the percentage point differences between them is shown on Chart 17.

During the first several years of the 1980s, colleges and universities attempted to make up some of the losses in faculty income with compensatory salary increases. The rate of faculty salary increase in higher education as a whole peaked in 1981 and 1982, and then generally slowed over the next five years. This is the same pattern as in tuition, which also peaked in 1981-82.

The real income of college and university faculty reached its highest level in the early 1970s, as shown on Chart 18. From 1971 to 1980, their real income eroded to a level in 1980 about 24.7 percent below the 1970 peak. From 1980 to 1987 faculty regained about two-thirds of the losses. Thus, at the end of the 1980s, on average, the faculty have real incomes about equal to what they had in the mid-1970s, but considerably below what they had at the end of the 1960s and early 1970s.

The rate of increase in faculty salaries did not exceed the rate of increase in the CPI until 1982, the year that starts the period of recovery of losses of real income experienced from 1971 to 1982.

The outlook for faculty salaries in the 1990s, and consequently the outlook for higher education costs in the next decade, thus depends on whether the rest of the loss in real income they experienced in the 1970s is made up.

Over the decade of the 1970s, faculty lost real income at a much greater rate than other professionals, as shown for attorneys, engineers, chemists, and accountants on Chart 19 and for doctors on Charts 20 and 21. Thus, college and university faculty lost real income and relative economic status.

College and university faculty also lost in relation to public school teachers, who have by the mid-1980s reached the real income level they had gained in the early 1970s. College faculty have not.

In 1970, an assistant professor at a comprehensive public university, on average, earned more than the median family income. By the mid-1980s, as illustrated on Charts 22 and 23, that assistant professor earned less than the median family income—though many faculty families have increased their income in the face of rising living expenses by increasing the number of family members who work.

Some individual faculty salaries are high compared with other academic salaries, but not compared with industry. On average, however, cost containment would leave the real income of most faculty below the levels that had been gained in the 1970s, and with a permanent reduction in relative economic status as compared with workers generally.

The loss of relative economic status by college faculty may not have driven many out of teaching who have already committed themselves to a career in higher education. The loss of relative economic status may figure much more prominently in the decisions of *new graduates*, however, as they compare salary offers from education and industry in the 1990s.

Efforts to Hold Down Compensation Costs

Student/Faculty Ratios

In efforts to hold down costs and increase productivity, colleges and universities have increased

student-to-faculty ratios in the 1980s. The patterns have been different in the public and the private sectors, however, as can be seen on Chart 24.

In public colleges and universities, explosive growth of enrollments in the late 1960s pushed student/faculty ratios to relatively high levels. Then, during the subsequent period while the rate of inflation was still comparatively low, public colleges reduced the number of students per faculty member until 1977. Since then, as budget constraints intensified, the public colleges have slowly but steadily increased the number of students per faculty member, though—at just under 18 students—it has not yet reached quite as high as 19 students, where it stood in the early 1970s.

In the private colleges and universities, the number of students per faculty member has been growing since 1970, though the long-term trend is overlaid with strong cycles that appear to reflect short-term changes in enrollment levels. The number of students per faculty member at private colleges and universities is currently at just over 14 students, which is still under the peak level of about 15 students reached in the early 1980s.

Employment of Part-Time Faculty

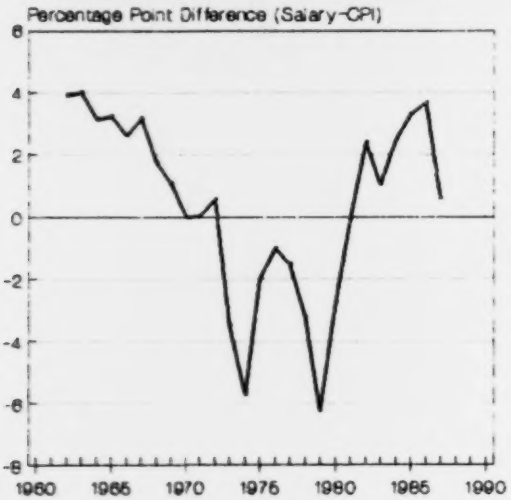
In response to financial pressures, and in an effort to reduce fixed commitments and increase program flexibility, colleges and universities have hired more and more part-time faculty. During the 1970s, the percent of part-time faculty rose steeply from about 22 percent to about 34 percent. Since then the percent of part-time faculty has continued to increase but at a much slower rate, as depicted on Chart 25.

Chart 16
Trends in Faculty Salaries Compared with the CPI

Source: Carol Frances & Associates
Calculated from Bureau of Labor Statistics (BLS) and American Association of University Professors (AAUP) data

Chart 17

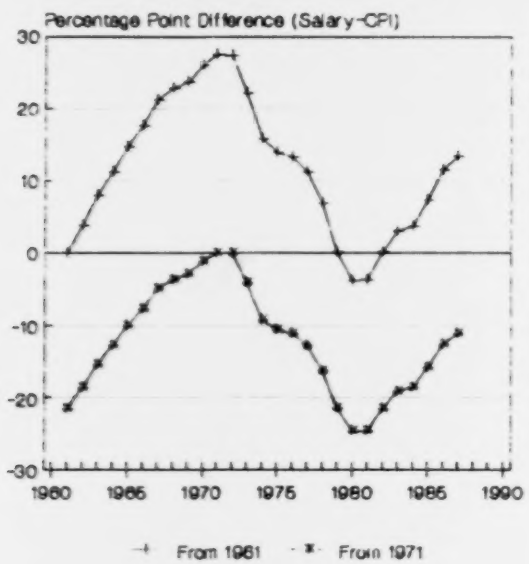
Faculty Salaries—CPI:
Difference in Annual Rates of Change—
Annual Real Income Gains/Losses



Source: Carol Frances & Associates
Calculated from BLS and AAUP data

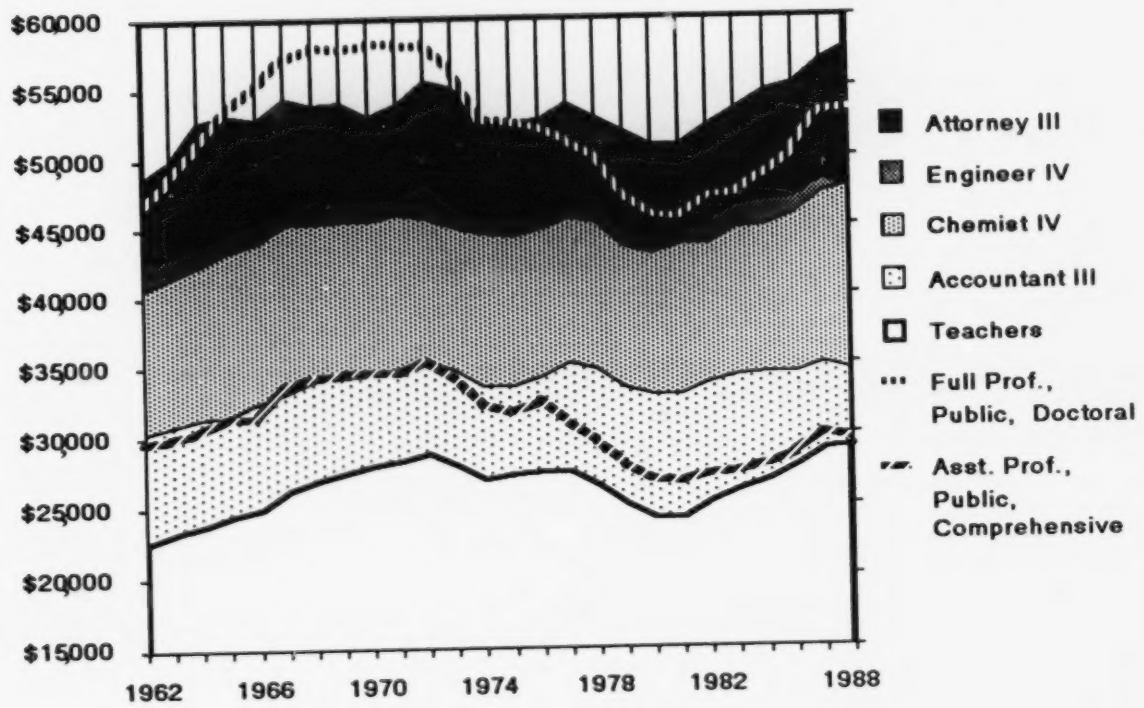
Chart 18

Cumulative Lag
in the Purchasing Power of Faculty Salaries



Source: Carol Frances & Associates

Chart 19
Trends in the Average Salary in Teaching and in Selected White-Collar Occupations
1989 Dollars

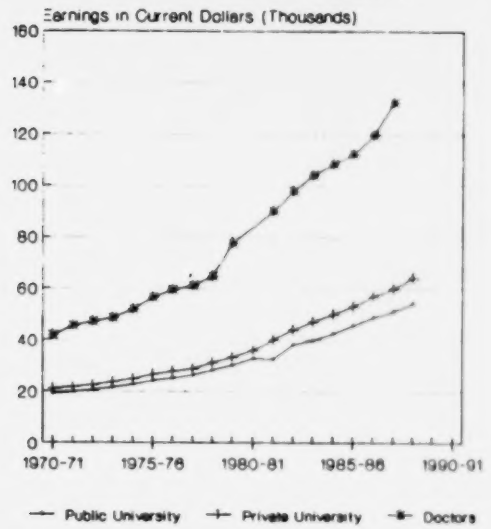


Source: F. Howard Nelson, *Survey and Analysis of Salary Trends*, Research Report, American Federation of Teachers, 1989.

Chart 20

Income of Full Professors Compared with Income of Physicians

(Independent Practitioners)

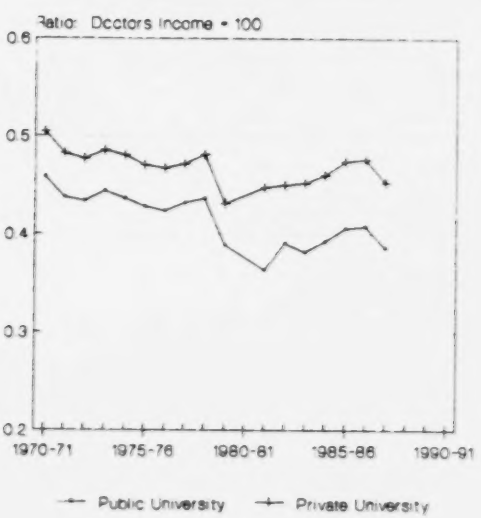


Sources: AAUP, American Medical Association (AMA)

Chart 21

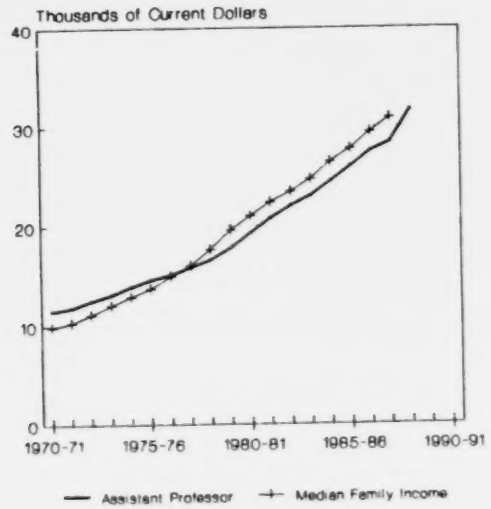
Ratio of Full Professors' Income to Physicians' Income

(Independent Practitioners)



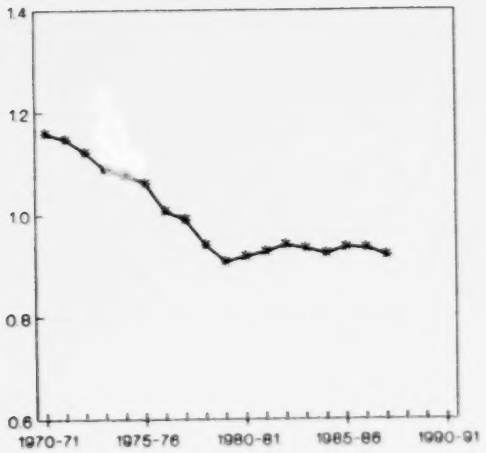
Sources: AAUP, AMA

Chart 22
Trends in the Income of Assistant Professors Compared with Median Family Income



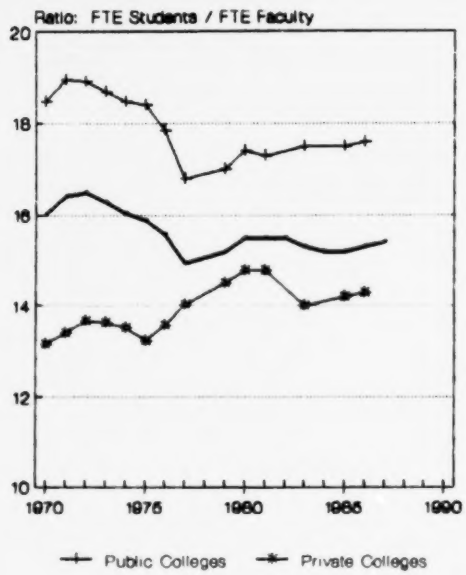
Sources: USDC, AAUP

Chart 23
Ratio of Assistant Professors' Income to Median Family Income



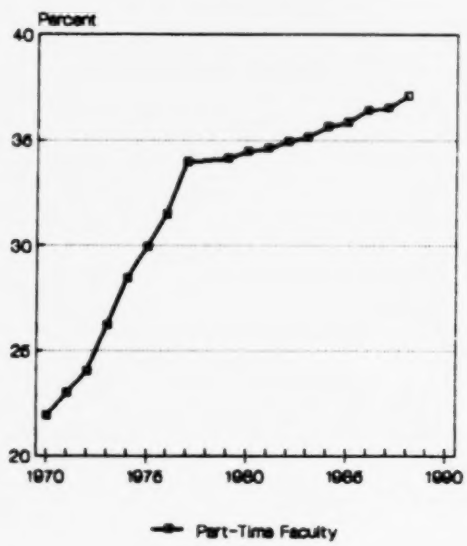
Sources: USDC, AAUP

Chart 24
Student/Faculty Ratio



Sources: USDE, NCES, DES (1988)

Chart 25
Part-Time Faculty:
Percent of Total Faculty



Sources: USDE, NCES, DES (1988)

7

State Higher Education Appropriations

Trends in state appropriations for higher education are a major factor in explaining trends in tuition at public colleges. From 1980 to 1983 state appropriations for higher education grew comparatively slowly. State appropriations per student, adjusted for inflation, actually declined from 1980 and reached a low point in 1983. These years correspond precisely with the years of the highest rate of increase in college tuition.

Trends in state support for higher education in both current dollars and in constant 1986 dollars are shown on Chart 26. The chart reveals that real state support adjusted for inflation reached a plateau in 1978 and 1979 and then eroded each year from 1980 to 1983. Chart 27 shows that these years of erosion of the real value of state support per student from 1980 to 1983 are exactly the same period when student tuitions were increasing at the greatest rate.

After bounding back up in 1984 and 1985, in more recent years the rate of increase in state appropriations for higher education has slowed again. Inflation has come down even more, however, so state support has increased in real terms, thus relieving some of the pressure to increase the tuition that students pay.

The impact of the shortfall in state and federal funding on the rate of tuition increase can also be seen by comparing the patterns of increase in all the major sources of colleges and university revenues for the late 1970s—when tuition increases were more moderate—with the patterns in the early 1980s—when the rate of tuition increases peaked.

The differences can be seen by comparing Charts 28 and 29. Chart 28 shows the rates of increase in each of the major sources of college and university revenues for the last three years of the 1970s, and Chart 29 shows the same information for the first three years of the 1980s. The bars in both charts represent the rates of increase in total current fund revenues and in each of the major components: tuition, gifts, endowment income, and sales, which are the revenues derived from private sources; and federal, state, and local, appropriations and grants and contracts, which are the revenues derived from public sources.

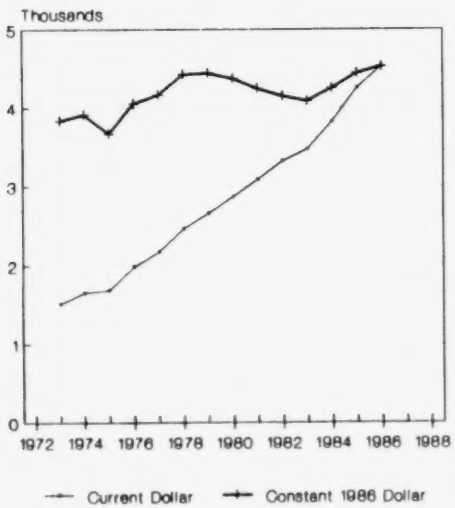
Chart 28 shows that in the late 1970s federal and state revenues increased at about the same rate as total current fund revenues. Tuition also increased at about the same rate, and thus there was little change in the share of total revenues provided by students. In contrast, Chart 29 shows that, in the early 1980s, federal and state revenues grew at slower rates than total current fund revenues and, consequently, tuition and other private sources were needed to balance the budgets.

In the last three years of the 1970s, total current fund revenues grew 36.9 percent and tuition revenues grew at about the same rate of 34.5 percent. In contrast, in the first three years of the 1980s, total current fund revenues grew 26.3 percent, and because of shortfalls in public sources of support, tuition revenues had to be increased by 45.8 percent to balance the budgets.

The same pattern emerges in looking at the period from academic years1979-80 to 1985-86, the latest year for which higher education finance data are currently available. Generally, to cover an expenditure increase of about 70 percent, total current fund revenues had to increase by about 70 percent as well. Revenues from public sources increased only by about 60 percent—and the shortfall was made up by increases in tuition and other private sources of funds that were close to 90 percent. The differences in the rate of increase in the private and the public sources of the revenues of the colleges and universities for the more recent period are shown on Chart 30.

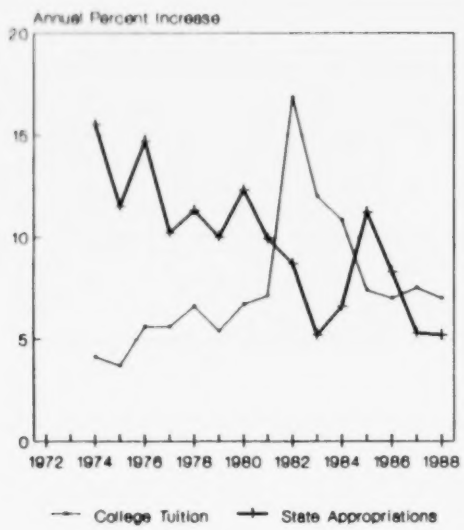
The annual rates of increase in tuition in relation to the rates for revenues from public sources and for expenditures per student on education are shown on Chart 31. The large percentage increases in tuition at public colleges in the early 1980s were not driven by large increases in current fund expenditures per student. Indeed, the period of accelerating increases in tuition occurred during a period of absolute decreases in spending per student. The chart shows that the period of high rates of tuition increase and declining spending per student occurs at about the same time as the period of slowdown in the growth of funding for public colleges from public sources.

Chart 26
State Higher Education Appropriations Per Student
1973 to 1986



Sources: State Higher Education Executive Officers (SHEEO), NCES, HEPI

Chart 27
Relationship Between Increases in State College Tuition and State College Appropriations



Source: SHEEO

Chart 28
Increases in Current Fund Revenues
By Source
1977-78 to 1980-81

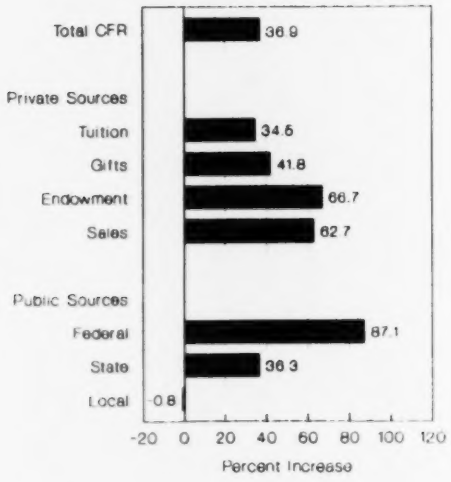


Chart 29
Increases in Current Fund Revenues
By Source
1980-81 to 1983-84

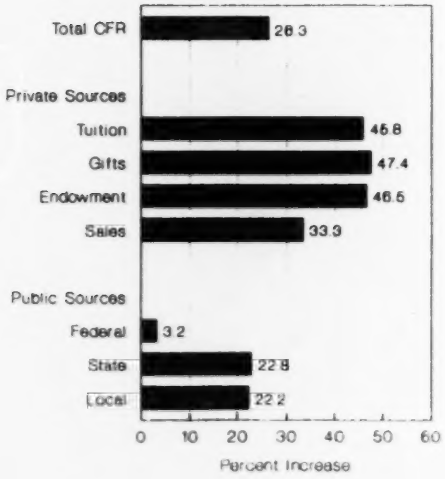
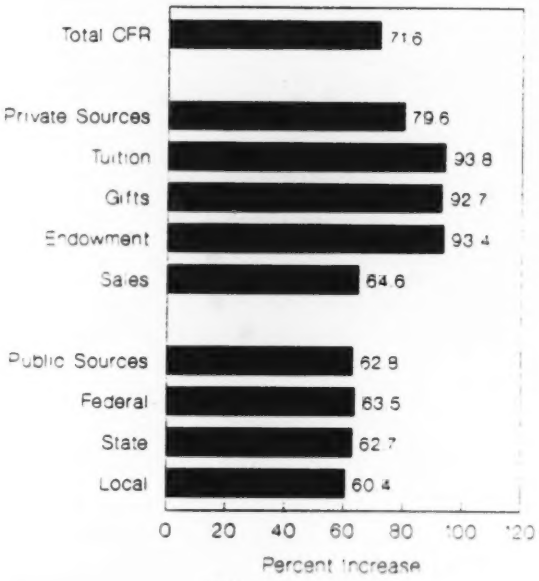
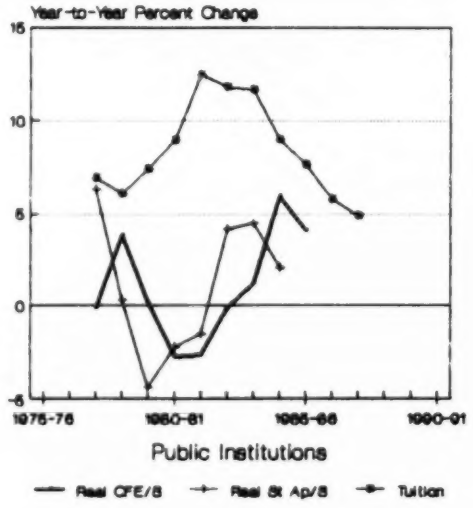


Chart 30
Increases in Current Fund Revenues
By Source
1979-80 to 1985-86



Source: USDE

Chart 31
Trends in Current Fund Expenditures
Per Student
Compared with State Appropriations and Tuition



8

Shortfalls in Student Aid Funding

Shortfalls in federal student aid funding since 1980 have contributed to pressures to increase college tuitions. To make up for shortfalls in federal student aid, institutions have significantly increased the amount of student aid they provide to students. Since 1980, the amount of scholarships and fellowships provided by or through colleges and universities themselves has almost doubled—reaching close to $4 billion by the mid-1980s and almost $5 billion by the end of the 1980s.

Most institutionally funded student aid is awarded to students as grants rather than loans. From 1980-81 to 1987-88, institutions increased the amount of aid awarded to students by close to $2.5 billion.

Over the same period the total amount of federal student aid grants actually decreased about $1.3 billion, the net result of a $3.5-billion decrease in veterans, social security, and other programs of educational benefits outside of the Department of Education that were not entirely offset by increases of $2.2 billion in Pell and other grant programs within the Department. This net change in student aid by funding source from 1980-81 to 1987-88 is shown on Chart 32.

During the 1970s, federal outlays for student grant programs were greater than outlays for loan programs. During the 1980s, federal funds for grant programs have declined, and all of the net increase in federal outlays for student aid during the 1980s has been in the loan programs. The shift in federal outlays from grants to the loan programs is shown on Chart 33.

Adjusting Student Aid for Inflation

Total student aid in current dollars has increased during the 1980s. But those current dollars must be adjusted for inflation into dollars of constant purchasing power to assess the trends in the real value of the aid available to students to help pay for college.

Conventionally, the current dollar value of student aid has been adjusted for inflation using the CPI. After making the adjustment using the CPI, some analysts have concluded that the value of aid, including both loans and grants, had been restored in real terms to the 1980-81 level by 1987-88. This conclusion does not hold, however, if a more technically correct adjustment of student aid for inflation is made.

Student spending patterns are not accurately reflected in the market basket for all consumers measured by the CPI, and thus, technically, the CPI is not an appropriate measure of inflation of the costs students face.

To make a preliminary assessment of the actual trends in the real value of student aid, using an adjustment for inflation that is technically more correct, we constructed a mock-up of an index of student costs to use in adjusting the current dollars to constant dollars. The student cost index mock-up was constructed with data on student costs for tuition and fees, and room and board, from the National Center for Education Statistics (NCES). The student cost index mock-up combines cost data for the public and private sectors proportionate to their full-time-equivalent enrollment in the base year 1980-81.

The growth of student aid was compared with the growth of student costs for tuition, fees, room and board. In the 1970s, student aid grew faster than student costs. In the 1980s, the opposite is true: student costs grew faster than total student aid.

Loan programs are not the same as grant programs in their impact on real and perceived student opportunities to go to college. Loans, which have to be paid back, do not reduce the cost of a college education—grants do.

The amount of federal grants dropped $1.3 billion in the early 1980s. This reduction occurred during the same years that the rates of increase in tuition reached the highest levels. And the total level of student aid grants, again including grant programs both inside and outside the Department of Education, has not increased much in the late 1980s.

Looking again at federal grants to students—but this time adjusting them for inflation using the

student cost index mock-up —it appears that the real value of student grants adjusted for the actual costs that students face in 1987-88 is not much more than half of what it was in 1980-81. The enormous difference in the trend in student grants made by using the more correct adjustment for inflation is shown on Chart 34.

Adding up the dollar difference since 1980—estimated by using the student cost index mock-up instead of the CPI to adjust student aid for inflation—the estimate of the aggregate amount of student aid grants in real dollars is reduced by another $10 billion.

Some analysts would argue that, from an institutional perspective, using a student cost index to adjust student aid for inflation is circular. Most institutions do have considerable control over the tuitions they charge—and tuition increases do create the need for additional institutionally funded student aid increases, which in turn drives another round of tuition increases in an upward spiral. The students, however, do not have control over the tuitions they face, and from the students' perspective a student cost index is technically much more appropriate to use in adjusting student aid for inflation than the CPI.

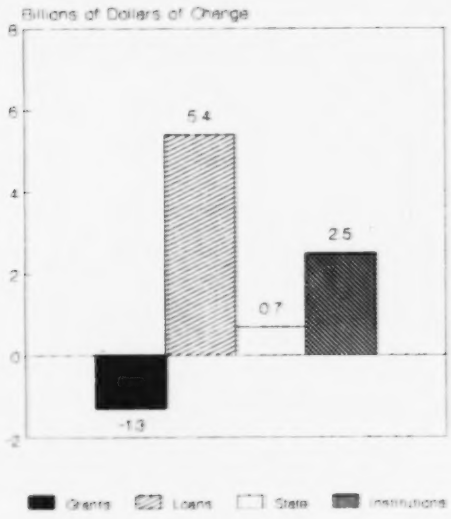
Some analysts have also concluded that institutionally funded student aid has not had much impact on tuitions. To reach that conclusion, however, they divide the total amount of institutionally funded student aid by total enrollment and compare this calculated average amount of aid per student with the average tuition charged.

But that conclusion is based on a miscalculation because only some of the students receive the institutionally funded student aid while the tuition of the other students who do not receive the aid is increased, in part, to pay for it. If, for example, half of the students receive institutionally funded student aid and the other half do not, the tuition increase for the non-aided students needed to pay for the aided students would be double that estimated by using total enrollment to figure the average impact of institutionally funded student aid on tuition charges.

An estimate of the increase in tuition at private colleges needed to pay for institutionally funded student aid was generated using data on: (1) tuition revenues, (2) that part of institutional scholarships and fellowships awarded from unrestricted funds (excluding those from restricted funds that may have been provided by outside sources), and (3) enrollments. All of the estimates are close to the actual magnitudes. The example is illustrated on Chart 35.

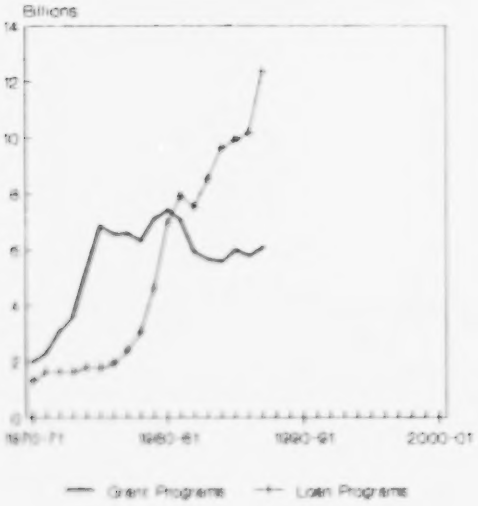
This estimate shows that if, as is likely, a substantial part of the institutionally funded student aid is funded in turn by increases in tuitions, the impact on tuitions is not only large but substantially greater in the 1980s than in the 1970s.

Chart 32
Change in Student Aid
By Sector
1980-81 to 1987-88



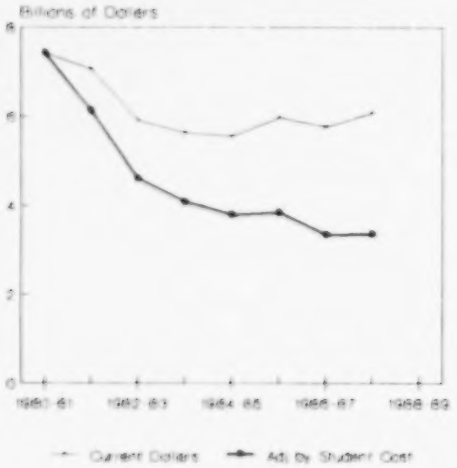
Source: The College Board

Chart 33
Federal Student Aid
Changing Composition
From Grants to Loans



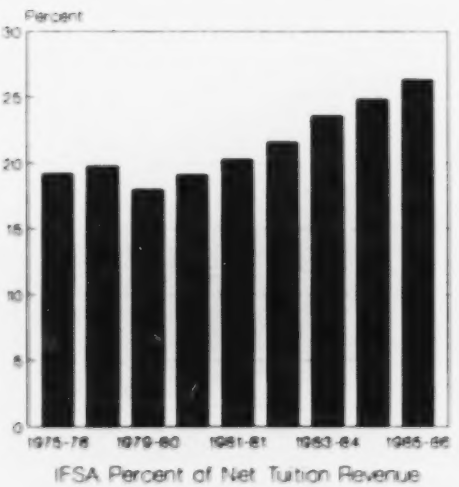
Source: The College Board

Chart 34
Federal Student Aid:
Student Grant Programs
Current Dollars/Adjusted by Student Cost



Sources: Calculated by Carol Frances & Associates using USDE, USDC, and College Board data

Chart 35
Estimated Impact
of Institutionally Funded Student Aid
on Private College Tuition



Source: NCES

9

Shortfalls in Funding for Research

Shortfalls in funding for research are also putting increased financial pressure on colleges and universities.

Total funding for research performed by academic institutions has increased dramatically since 1980, virtually doubling from $6.1 billion to $12 billion annually over the period from 1980 to 1987. Federal funding for research performed by higher education institutions has also increased over the same period but at a slower rate, increasing by $3.2 billion, or 78 percent, from $4.1 billion in 1980 to $7.3 billion in 1987.

Analysts looking only at the large increases in federal funding for research at universities and colleges have overlooked the fact that research expenditures have grown even faster than outside revenues for research in recent years—and the difference is being funded by the institutions themselves.

Those people inside universities who are close to the situation are much more aware than outsiders that research is an area of growing financial pressure because a larger and larger share of research is being paid for by the institutions.

From the early 1950s through the mid-1960s, sharp increases in federal funding of research reduced the share of the funding provided by the institutions themselves. At the lowest point, institutions provided about 8 percent of the funds. Since the mid-1960s, the share provided by institutions has climbed higher and higher, with large additional increases in the early 1980s. Since the mid-1960s the share of research funded by the institutions has more than doubled, from about 8 percent to almost 18 percent in 1987. These trends are shown on Chart 36.

Concomitantly, the funding for university research from outside sources per dollar of funding provided by the institutions themselves has dropped to a current level less than half of what it had been in the mid-1960s. In the peak year of 1964, the federal government provided $8.90 for research performed by the universities for every dollar they provided themselves. By 1987, the amount the federal government provided had dropped to only $3.45, a decline of over 60 percent. This drop in the ratio of outside funding per dollar of inside funding is shown on Chart 37.

Many research institutions also report a drop in the amount of indirect cost recovery from research projects that is available to reinvest in university programs.

Student tuitions may be funding some of the research, but even if they are not, the increasing share of research the institutions are funding themselves draws on discretionary funds they would otherwise have available for other uses, including restraining tuition increases.

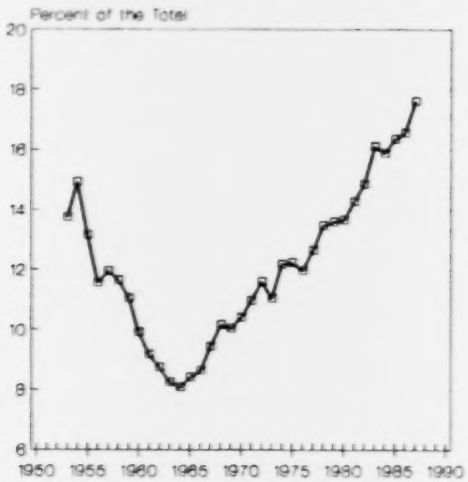
The ever-pressing question in seeking explanations for increases in higher education costs and spending is whether the increases are driven by internally generated aspirations of the institutions themselves—to improve quality or expand their programs—aspirations they can moderate; or by externally driven pressures—such as competition from industry—which they cannot easily control; or some combination of both.

Most likely, both sets of forces are present. It may be relevant in trying to assess the balance between internal and external forces to consider that in the 1980s, at the same time self-funding of research by the colleges and universities has increased dramatically, federally funded research performed by industry has been growing at twice the rate for federally funded research performed by the universities.

Higher education still performs half of the federally funded basic research, but the rapid growth of basic research performed by industry signals intensifying competition confronting colleges and universities for researchers and for funds to invest in research plant and equipment needed to win research grants and contracts.

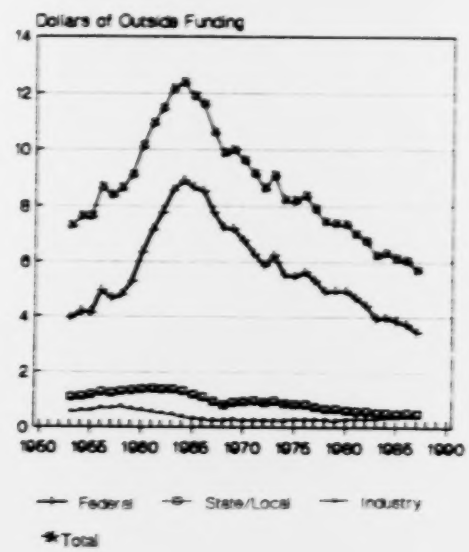
Consequently, colleges and universities face tough choices: either continued losses in the share of total research they perform, or increased costs to meet intensifying competition from industry, as well as from other institutions.

Chart 36
Percent of University R&D That is Self-Funded



Source: National Science Foundation (NSF)

Chart 37
Dollars of Outside R&D Funding Per Dollar of University R&D Self-Funding



Source: NSF

10

Overview: Fitting Tuition into the Larger Picture of College and University Finance

One problem with almost all analyses of higher education costs, spending, and spending pressures is that, conventionally, expenditures and revenues are examined separately. Yet when both expenditures and revenues associated with particular functions are looked at together—linking, for instance, tuition and instruction; fellowships from unrestricted funds with institutionally funded student aid; and restricted grants and contracts with research—then a much clearer picture emerges about where the financial pressures are coming from.

Thus, a better understanding of what is happening to tuition can be gained by fitting tuition into the larger picture of college and university finance by looking at both revenues and expenditures of institutions as entire enterprises, and by relating specific revenues to designated expenditures.

Anyone who attempts to relate different sources of revenue to particular uses starts out by learning that "funds are fungible"—meaning that, except for funds restricted to designated purposes, funds can be substituted for each other, and even restricted funds applied to one particular use can free up unrestricted funds for other uses.

Thus, the accounting does not permit exact matches of revenues and expenditures. Nonetheless, looking at trends in both specific expenditures and specific sources of revenue, roughly associated by function, does produce information about the probable direction of financial flows, and the resulting financial pressures.

It is also helpful to group revenues into categories over which colleges have less discretion and more discretion in the ways funds are spent. Similarly, expenditures can be grouped into categories over which the colleges have less discretion and more discretion.

Recognizing that the categories are arbitrary, soft, and ragged at the edges, they are nonetheless useful in identifying the initial sources of financial pressure. A first look at the classifications yields the following chart of accounts:

Categories of Revenues and Expenditures

Revenues
Less Discretion in Spending
- Tuition and Fees
- Appropriations
  - Federal
  - State
  - Local
- Educational Sales
- Auxiliary Enterprises
- Research Grants and Contracts
- Hospital

More Discretion in Spending
- Endowment Income
- Private Gifts, Grants, and Contracts
- Unrestricted Grants and Contracts
- Other Sources

Note: "Discretion" in spending is a characterization applied to the total stream of revenues and not just the net revenue from a particular source.

Expenditures
Less Discretionary
- Education
- Auxiliary Enterprises
- Research Funded by Grants and Contracts
- Hospitals

More Discretionary
- Institutionally Funded Student Aid
- Public Service
- Research Not Funded by Outside Grants and Contracts

Conclusions About Shifts in the Flow of Funds

Looking at the whole picture, and grouping all revenues and all expenditures into "more discretionary" and "less discretionary" categories, it is possible to see clear differences between the last half of the 1970s and the first half of the 1980s in the nature of the financial pressures colleges and universities are experiencing. These financial pres-

sures constitute an important part of the environment in which colleges and universities make decisions about tuition levels.

In the last half of the 1970s, increases in discretionary revenues significantly outpaced increases in discretionary expenditures, thus creating additional resources to use to support core education activities.

In the first half of the 1980s, the opposite is true: the total amount of discretionary expenditures—institutionally funded student aid, public service, and research not supported by outside grants and contracts—grew faster than discretionary revenues. This added to the overall financial pressures faced by higher education institutions.

Student tuition is not "funding" research. Rather, research and other discretionary activities are making greater claims on the discretionary funds of colleges and universities that would otherwise be available to help avoid increases in tuition.

The shift from the last half of the 1970s to the first half of the 1980s in the flow of funds over which the institutions have more discretion in the way they are spent—away from core education activities and toward institutionally funded student aid and research—is illustrated on Charts 38 and 39.

The actual rates of increase in revenues and expenditures, by type, showing the large differences between the rates for the core activities and the other activities is shown on Chart 40 for the public institutions and Chart 41 for the private institutions.

Thus, on balance, in the first half of the 1980s, discretionary expenditures added to the overall financial pressures experienced by higher education institutions and contributed to pressures to increase tuition. In contrast, discretionary revenues relieved financial pressures and enabled colleges and universities to hold down rates of increase in tuition in the late 1970s.

Trends in Endowment

Comments on two additional trends as they affect college and university resources conclude this section of the report, which attempts to fit tuition into the larger picture of higher education finance. The last two trends to be examined in this analysis are in endowment and enrollment.

The 1980s have seen a spectacular increase in college and university endowments. The market value of endowments soared—much more than doubling—from $20 billion in 1980 to $53 billion in 1986, and they have continued to climb since 1986.

The trends in endowment market values need to be put into perspective before concluding that the colleges and universities are well off because of the increase in market values.

One measure of the contribution that endowments potentially make to the resources available to colleges and universities to spend for education is the real value of endowments per student.

The increase in market value of endowments is shown on Chart 42. The adjustment of the trend for inflation using the HEPI is also shown on Chart 42. Chart 43 shows the real value of endowment per student, to take into account the increasing numbers of students that would benefit from the investment of the income from the endowment. Chart 43 shows that the colleges and universities suffered severe losses in the market value of their endowments as the stock market declined in the early 1970s. Not until 1986 did the colleges and universities regain the real value of their endowments per student that they had before the slide in the stock market in the early 1970s.

Also, large endowments are highly concentrated in very few institutions. Ranking all 3,300 colleges and universities in the official directory of the Department of Education by the market value of their endowments in 1983-84 shows that:

- Ten institutions accounted for almost one-third of the total market value of all of the college endowments in the country.
- The top 100 institutions accounted for between two-thirds and three-quarters of the endowments.
- At that time over 40 percent of the colleges and universities had endowments of $10,000 or less.

By law, endowment funds cannot be spent to meet current operating costs but must be held in perpetuity. Only the income and appreciation can be spent.

Assets have appreciated greatly in recent years. Many homeowners have found that the market value of their homes has doubled. But few of them have gone out and doubled the purchases they make for everyday living. Spending power of consumers and colleges does not increase unless the real income increases.

From a budget perspective, it is not the market value of the endowment that is important but the income and the appreciation that is available to

spend for current purposes. Endowment income accounted for only 2.1 percent of total college and university revenues in fiscal 1980-81 and only 2.3 percent in 1985-86 (0.6 percent for the public institutions and 5.3 percent for the private), as shown on Charts 44 and 45.

Part of the great increase in the market values of endowments is accompanied by *less* income from endowment. Colleges and universities hold large percentages of their investment portfolios in bonds. The bonds increase in asset values when interest rates decline. Thus, the increase in asset value is accompanied by less interest income to spend for current operations.

Decline in the College-Age Population

The decline in the college-age population resulting in "stable enrollments" has been offered as an explanation for increasing tuitions. Declining enrollment for an individual institution, resulting in fewer students over which to spread fixed costs and losses of economies of scale, can also result in higher costs per student and pressures to raise tuition. And declining enrollment for whole state systems, as in New Jersey, can also result in higher costs per student and pressures to raise tuition.

Trying to apply economies of scale arguments to explain recent tuition trends is ragged, however, because enrollments have not gone down. In fact, after upward revisions of preliminary estimates for 1988-89, the early estimates reported by NCES indicate that enrollment may reach an all-time high—close to 13.4 million students in 1989-90.

In earlier decades, rapid growth of enrollment did help to reduce the rate of increase in expenditures per student. Over the last 10 years, however, the economies-of-scale explanation does not hold up well at the national level. First, enrollments did not begin to level in the mid-1970s, but continued to increase through the late 1970s up until the beginning of the 1980s, as shown on Chart 46. A spurt of enrollment in 1975 foreshadowing the end of the Korean veterans' eligibility for educational benefits in 1976 resulted in a false signal that enrollment growth was slowing in the mid-1970s, but in fact enrollments continued to increase through 1981.

Thus, while the rate of increase in tuition was accelerating from 1977 to 1981 enrollment was also increasing—not decreasing—as the economies-of-scale argument would require, and while the rate of increase in tuition has been decelerating from 1981 onward, enrollment was moving sideways in a cyclical pattern, also not entirely consistent with an economies-of-scale argument.

However, the decline in the traditional college-age population has certainly been accompanied by intensified marketing and recruiting efforts, and these activities are costly to the colleges and universities, and they increase financial pressures.

Chart 38

College and University Finance: Changing Flow of Funds

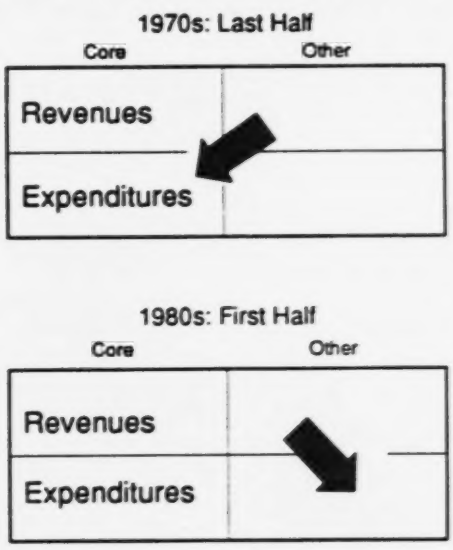


Chart 39

College and University Finance: Changing Flow of Funds

1980s: First Half

Core Revenues

Less discretion over spending, dedicated to particular uses:

Tuition and fees

Auxiliary enterprises

Appropriations

Restricted grants, contracts

Hospital revenues

Other

More discretion over spending:

Endowment income

Private gifts, grants Unrestricted grants, contracts

Other

Core Activities

Less discretionary:

Education

Dorms, bookstores

Research, funded by grants, contracts

Hospitals

Other

More discretionary:

Institutionally funded student aid

Research, not funded by grants, contracts

Public service

Chart 40

Difference in Growth Rates:

Revenues and Expenditures, By Type

Public Institutions

1970s: Last Half

		Discretionary:	
	Total	*Less*	*More*
Revenues	61.0	59.5	85.4
Difference in Growth Rate		- 0.8	+ 10.4
Expenditures	61.5	60.3	75.0

1980s: First Half

		Discretionary:	
	Total	*Less*	*More*
Revenues	50.5	48.7	75.3
Difference in Growth Rate		+ 2.0	- 2.6
Expenditures	49.	46.7	77.9

Chart 41

Difference in Growth Rates:

Revenues and Expenditures, By Type

Private Institutions

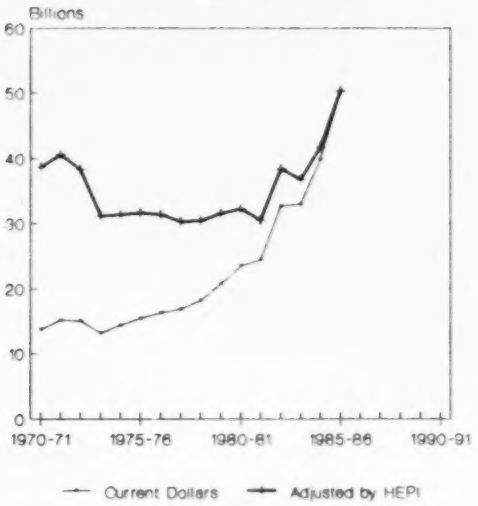
1970s: Last Half

		Discretionary:	
	Total	*Less*	*More*
Revenues	74.0	71.4	84.1
Difference in Growth Rate		+ 1.4	- 1.6
Expenditures	71.2	69.8	86.5

1980s: First Half

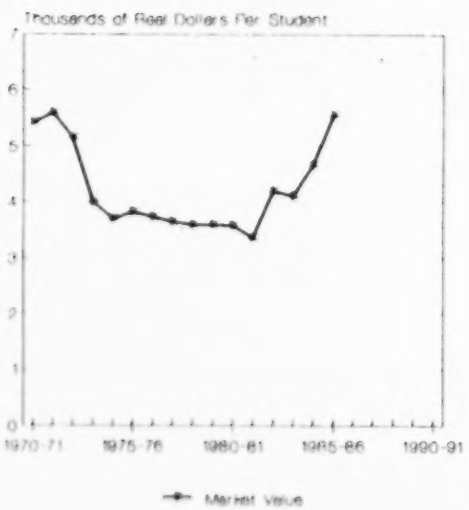
		Discretionary:	
	Total	*Less*	*More*
Revenues	58.3	58.1	58.8
Difference in Growth Rate		+ 4.7	- 42.3
Expenditures	57.7	53.4	101.1

Chart 42
College and University Endowment Trends
1970-71 to 1985-86



Source: USDE

Chart 43
College and University Endowment Trends
1970-71 to 1985-86



Source: USDE

Chart 44
Endowment Income as a Percent of Total Revenue
Public Institutions

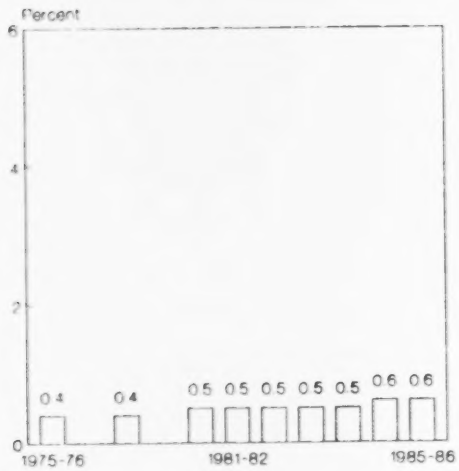
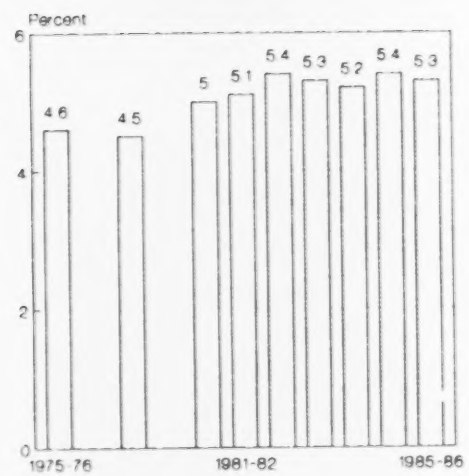
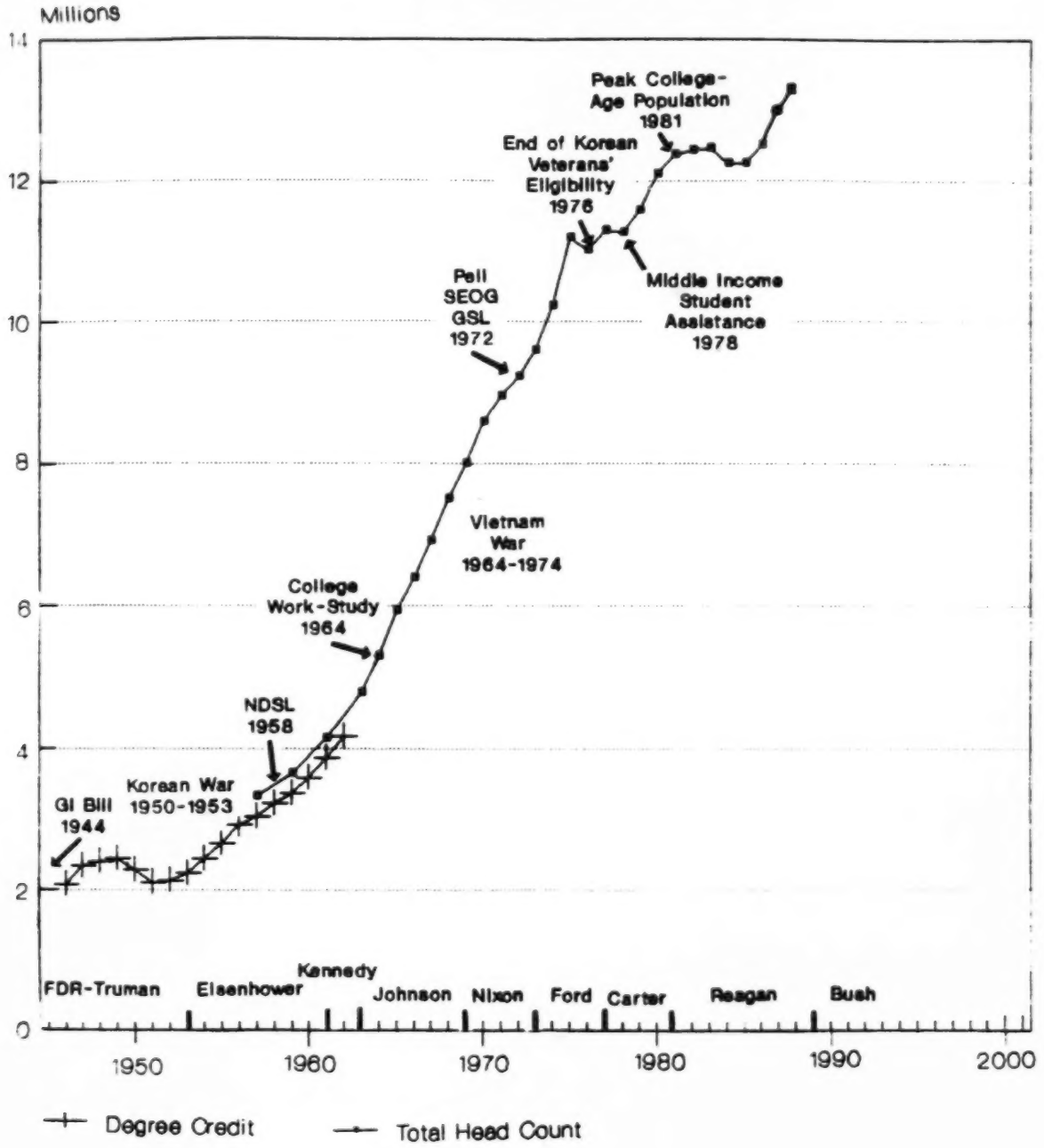


Chart 45
Private Institutions



Source: USDE

Chart 46
Chronology of Economic Cycles and Political Events that have Affected College Enrollments



Source: NCES

11

The Outlook for College Costs and College Tuition in the 1990s

College costs and college tuition levels depend not only on economic conditions but also on management decisions and public-policy choices. Some factors are entirely outside the control of institutions, but some are within the control either of the people on campuses, or the people in government, or the people in the private sector who make college and university funding decisions. In preparing for the 1990s, it is useful to try to identify the major factors that will play a part in shaping the outlook and to put them into perspective.

Economic Conditions

Federal Budget Deficit / Student Aid Funding

The federal budget deficit hangs over all discussions of domestic social policy and of the resources available for education at the federal and the state level. It weighs on discussions at the state level, because the federal government shifted to the states important health and welfare functions that compete with education for funds. The country has not been able to grow out of the deficit in the past eight years, and the prospects are dim that it can be done during the current Administration.

The American people want government services but do not want to pay for them. Neither the President nor Congress, neither Republicans nor Democrats, have been willing to make the politically costly move to suggest specific sources of new revenue. Nor, while we engage in ritual denunciations of our elected representatives, may we evade the fact that there is no segment of the American public from which a demand for new taxes has been heard.

The deficit is, consequently, likely to remain intractable. Consequently, it will remain difficult to find additional funds for significant increases in student aid. It would take almost double the amount of federal student aid grants currently awarded to restore the grants to parity with their purchasing power in 1980-81. Increases in student aid, if the funds could be found, would help significantly in holding down tuitions, which are driven up, in part, to pay for institutionally funded student aid.

If there are no significant increases in federal revenues, then the best hope for education and the other domestic social programs are reallocations within the existing budget constraints.

Higher education will have a particular interest in following the course of Gorbachev's *perestroika* to see whether the Soviet Union's domestic economic difficulties do, indeed, lead to new thinking and a scaling back of its military expenditures—which would safely permit a re-examination of our own budget priorities.

Inflation

Inflation has fallen more sharply in the 1980s than almost anybody had dared hope at the beginning of the decade. The easing of inflation greatly benefited higher education, which was particularly hard hit by the earlier upsurge in costs. The prospects are now, however, for at least mild increases in general price levels. Increases in inflation compound the pressures on colleges and universities because adjustment to inflation is generally slower in higher education than in other sectors, in part because tuition prices are set once, the prior year, and not continuously as they are at check-out counters and gas pumps.

Demand for College Education

Demand for college education has remained high, in spite of increases in tuition. In the 1990s, the demand is likely to continue to be strong. The reasons are both positive—public recognition of the importance of education in enhancing economic and social mobility—and negative— losses of jobs for people with only a high school education in a knowledge-based economy.

Trends in the Ability to Pay for College

Increases in tuition have greatly outstripped increases in student and family resources to pay for college, and borrowing has increased. Cumulative

commitments under the Guaranteed Student Loan program have more than tripled since 1980, from just over $20 billion to well over $60 billion. Thus, ability to pay is being superseded by ability and willingness to borrow. But concern is growing that at some point tuition levels will exceed not only the ability to pay but also the willingness to borrow to pay for college. This will put a damper on still further increases in tuition in the 1990s.

State Support

Education is usually the largest single expenditure in state budgets, and outlays for education have increased significantly in the 1980s. But the increased outlays have generally not kept up with the combination of increases in enrollments and increases in costs, with the result that a larger share of the cost of education is covered by increasing tuitions. Even if economic prosperity increases state revenues, there will be continued pressure on state budgets from other social programs and, therefore, continued competition for the funds that could be used to hold down tuition increases.

Unfunded Pension Liabilities

Keen attention has been focused in recent years on rates of return and diversity of investment options in private pension plans for faculty, while the serious problems in many state university retirement systems have been overlooked. Nationally, there are billions of dollars of unfunded pension liabilities in state university retirement systems covering college faculty. In the 1990s, there will be a large increase in the numbers of faculty retiring and claiming benefits.

At some point, the states will have to make up the shortfalls in funding of their pension systems that have been accumulating for years. When that happens, there will be intensified competition in state budgets between funds for the college operating budgets and funds for the retirement system. That competition will become still another source of state budget pressure that could translate into pressures to raise college tuition.

Demographic Trends

Demographic trends will affect state budgets and the state resources available for higher education. The projected sharp increase in the first half of the 1990s of the numbers of school-age children, reversing the steady decline from the early 1970s to the mid-1980s, will require much greater state funding for elementary and secondary education, which will put much greater pressures on state budgets for postsecondary education, which in turn will increase pressure to raise tuitions at public institutions.

Management and Public Policies Affecting the Outlook for Tuition

Tuition Policies

Formal and informal policies governing tuition play a large role in establishing the environment in which tuition levels are set in public and private colleges and universities. In the 1970s, institutions in both sectors generally tried to hold tuition as low as possible to expand access for students.

In the 1980s, with inflation and limited budget resources, there was pressure to increase tuitions and offset the increases for the needy students with increased student financial aid. Whether the philosophical underpinnings of the arguments for increasing tuitions were accepted or rejected, tuitions were driven up inexorably by rising costs and shortfalls in nontuition revenues. Then, financial aid did not keep up with the needs of the students, more of the cost was shifted to the students, there were large increases in student borrowing to pay for college, and the enrollment of black students declined.

In the 1990s, there may be a fundamental reexamination of tuition policies and student aid policies, looking afresh at age-old questions of who benefits and who pays for college, with the added ingredient of new interest in how public service, before or after college, might enable students to help pay for their education.

Commitment to Greater Educational Opportunity

During the 1970s, the nation made a commitment to broaden access to higher education by reducing financial obstacles through increasing student financial aid. Enrollment of black students increased in the 1970s but has dropped again in the 1980s.

If colleges and universities try to reverse the decline, and if federal student aid programs are not sufficient, institutionally funded student aid is likely to increase. This will put upward pressure on the college and university budgets.

Quality Competition

National attention in the 1980s has focused on the need to improve educational quality at all levels.

Recently, leaders in some of the elite institutions of higher education report feeling they have become part of a continuing cycle of quality competition, with higher aspirations supported by higher tuitions. These colleges and universities would tend to be among the price leaders whose tuition increases are widely reported in the newspapers. There is much debate, however, about to what extent this may be going on, and how the costs and benefits might be distributed.

In the previous Administration, Secretary of Education William Bennett pressed the educational institutions hard to achieve improvements in quality without additional funding. In the current Administration, the new Secretary, Lauro Cavazos, having been a college president himself, appears to realize that improvements in quality cost money, and that will put additional upward pressures on tuition in the coming decade.

Commitment to Research

Historically, most of the funding for research performed by colleges and universities was provided by federal sources. In the early 1960s, the federal government provided about $8.90 for every dollar invested by the institutions in their own research. The amount of federal funding per dollar of institutional funds has declined in the 1970s and 1980s. By the mid-1980s, federal funding of college and university research per dollar of the institution's own funds had dropped to $3.45, or less than half the level in the 1960s.

The cost of research equipment is soaring while the share of the funding for research from outside sources continues to decline.

Either higher education will have to invest in the equipment to stay on the leading edge of research, which will continue to put upward pressure on costs and spending, or higher education will relinquish a larger share of basic research to industry or work with industry using industry equipment with unforeseen longer-term consequences for the academic sector.

Commitment to Public Service and Health Care

Colleges and universities are being called upon to play larger roles in local and regional economic development and in the delivery of health care. These functions cost money. If additional funding is not provided, and it is deemed important to do the work, then more internally generated funds will be used for these purposes, which puts upward pressure first on budgets, and then on tuition. It is not that tuition funds these activities but that discretionary funds that would otherwise be available to hold tuition down are used for these purposes.

Faculty Salaries

The most important factors in projecting the costs of higher education into the 1990s are institutional management and public-policy decisions affecting faculty salaries. These salary decisions, in turn, reflect explicit and implicit economic, political, and social decisions about the economic position of people who work in higher education in comparison with workers in other sectors.

During the 1960s, college faculty gained in economic status relative to professionals generally. During the 1970s, however, these gains were eroded, and by the end of the decade, the real income of the faculty had slipped back to the levels of the early 1960s. During the early 1980s, colleges and universities awarded compensatory salary increases at rates greater than the rate of inflation, which restored some of the lost purchasing power, though faculty income remains below levels reached in the late 1960s. Unless there is a permanent reduction in the relative economic status of faculty to a level below the levels achieved in the 1960s, then there will be continued pressures for salary increases above the rate of general inflation for several more years.

If, however, the relative income of faculty is judged to be about where it should be, then faculty salary increases in the 1990s will not be required to be above the general rate of inflation and they will not be a source of added upward pressure on college and university budgets.

Competition with Industry

While faculty lost ground in relation to the cost of living, they lost even more ground in relation to professionals with similar levels of education and responsibility in other sectors of the economy. The widening salary gaps between those employed in higher education and those employed elsewhere can be expected to put more upward competitive pressure on faculty salaries in the future than in the past.

The widening salary gaps have not had much effect in terms of encouraging large numbers of

faculty already employed in higher education to leave teaching to move to industry. But the widening salary gaps may have a much greater impact on the decisions of new graduates deciding whether to enter a career in college teaching. Even if enrollments do not increase in the 1990s, colleges and universities will need to hire faculty to replace the people hired in the 1950s and 1960s who will retire in the 1990s.

It has been argued that as more highly paid senior faculty who retire are replaced by junior faculty, cost pressures in higher education will be mitigated. At least a partially offsetting consideration is, however, that a smaller percentage of the new graduates has been preparing to go into teaching, and the colleges and universities will have to attract new entrants into teaching who have much higher-paying alternatives elsewhere. Or they will have to attract people already employed in the private sector. This will put upward pressures on salaries, higher education costs, and tuition.

Some farsighted institutions are preparing themselves to meet future faculty shortages by undertaking faculty development programs. Those development costs are reflected in current operating budgets.

As a technical consideration, the replacement of the senior faculty member who retires with a junior faculty member may relieve spending pressures, but not cost pressures reflected in the HEPI. The junior faculty member may be hired at a lower salary than the senior faculty member, but at a higher salary than that of previous junior faculty members. The impact of this replacement on higher education costs and on higher education spending will diverge. It may very well reduce spending and increase costs. The reason is that in a HEPI with fixed weights, the change in the mix of faculty by level, with a smaller percentage of professors and a larger percentage of assistant professors, will not be reflected. On the other hand, the increase in the relative salaries of assistant professors will be reflected.

And clearly, if experience is a valuable asset in teaching, in many subject areas most replacements of senior faculty members with junior faculty members will not result in the same quality of educational services provided.

Pay Equity

Efforts to open opportunities for women and minorities in higher education administrative and teaching positions in the late 1970s and early 1980s did result in larger numbers being employed. While progress was made in the numbers employed, there was little progress made in narrowing the gap between the salaries paid men and those paid women and minorities. Women in higher education typically earn about 80 percent of men's salaries for equivalent jobs.

If efforts are made in the 1990s to bring the salaries of women and minorities to the level of those of men with equivalent responsibility and experience, this will put additional upward pressure on higher education costs.

Meeting the Capital Requirements for Higher Education

The 1990s may be a period of greatly increased capital requirements. While progress has been made in working off the backlog of deferred maintenance and improving energy efficiency, the budgetary impact of new technology, including new communications centers and new research equipment, can be enormous. Instruments that used to cost a few thousand dollars are being replaced by more sophisticated technology that could cost hundreds of thousands of dollars.

Cost analysis in higher education generally focuses on the costs of goods and services in the current operating budget. A preponderance of the current operating budget is composed of salaries. This often leads to a conclusion that higher education is more labor intensive than it actually is. Accordingly, the cost of capital used in providing educational services should also be included in the calculations.

Typically, in nonprofit higher education institutions—in contrast to profit-oriented business firms—the current operating budget and the capital budget are separate. This may make sense if the funds come from different sources or through different decision routes. But the separation of current operating costs and capital costs has generally led to an omission of capital costs from analysis of the total costs of education and of total cost trends.

Examination of the trends in college and university borrowing, and in the ratio of debts to assets, indicates that since 1980 there has been a voluminous increase in borrowing. If the service of that debt incurred to make capital improvements spills over into the current operating budget in the form of mandatory transfers into the plant fund, that could increase the current spending that has to be

covered by current operating revenues, again putting added pressures on college and university budgets that translate into pressures to increase tuition.

Looking Ahead to the 1990s

The rate of increase in tuition has slowed markedly, but not as much as the underlying costs. Tuitions have continued to increase, in part, because of shortfalls in other sources of revenue and the consequent shift of a larger share of the costs to the students.

On balance, there will be considerably greater external economic pressures pushing tuitions higher in the 1990s than there are restraints holding them down. Consequently, in establishing tuition levels, management's challenge will be to balance the internal educational imperatives and aspirations and against the external economic trends.

Most projections of tuition levels into the future are based on economic trends that the higher education institutions cannot control.

This report on costs and tuition focuses attention on educational, social, and political *choices* involved in setting tuition levels that the institutions, and the public and private agencies funding them, do control.

Appendix

TUITION AND REQUIRED FEES

	Universities		Four-Year Colleges		Two-Year Colleges		All Institutions	
	Public	Private	Public	Private	Public	Private	Public	Private
1964-65	298	1,297	224	1,023	99	702	243	1,068
1965-66	327	1,369	241	1,066	109	768	257	1,154
1966-67	360	1,456	259	1,162	121	845	275	1,233
1967-68	366	1,534	268	1,237	144	892	283	1,297
1968-69	377	1,628	281	1,335	170	956	295	1,383
1968-70	427	1,809	306	1,468	178	1,034	323	1,533
1970-71	478	1,980	332	1,603	187	1,109	351	1,684
1971-72	526	2,133	354	1,721	192	1,172	376	1,820
1972-73	566	2,226	455	1,846	233	1,221	407	1,898
1973-74	581	2,375	463	1,925	274	1,303	438	1,989
1974-75	599	2,614	448	1,954	277	1,367	432	2,177
1975-76	642	2,881	469	2,084	245	1,427	433	2,272
1976-77	689	3,051	564	2,351	283	1,592	479	2,467
1977-78	736	3,240	596	2,520	306	1,706	512	2,624
1978-79	777	3,487	622	2,771	327	1,831	543	2,867
1979-80	840	3,811	662	3,020	355	2,062	583	3,130
1980-81	915	4,275	721	3,390	385	2,413	633	3,498
1981-82	1,042	4,887	813	3,855	432	2,697	721	3,972
1982-83	1,164	5,583	936	4,329	473	3,006	798	4,439
1983-84	1,284	6,217	1,052	4,726	528	3,099	891	4,851
1984-85	1,386	6,843	1,117	5,135	584	3,485	971	5,314
1985-86	1,536	7,374	1,157	5,641	641	3,672	1,044	5,778
1986-87	1,651	8,116	1,248	6,171	660	3,684	1,106	6,316
1987-88	1,750	8,770	1,320	6,670	690	3,910	1,160	6,820

Source: USDE, OERI, NCES, *Digest of Education Statistics*, 1989, p. 281-82.

(Data for Charts 1, 3, 5, & 8)

TUITION AND REQUIRED FEES

	Universities		Four-Year Colleges		Two-Year Colleges		All Institutions	
	Public	Private	Public	Private	Public	Private	Public	Private
1971-72	526	2,133	354	1,721	192	1,172	376	1,820
1979-80	840	3,811	662	3,020	355	2,062	583	3,130
1987-88	1,701	9,000	1,310	6,660	700	4,020	1,190	6,950
Percent Increase:								
1971-72 to 1979-80	59.7	78.7	87.0	75.5	84.9	75.9	55.1	72.0
1979-80 to 1987-88	108.3	130.1	99.4	120.9	94.4	89.8	99.0	117.9

Source: USDE, *Digest*, 1989, pp. 281-82.

TUITION AND REQUIRED FEES
(Year-to-Year Percent Change)

	Universities		Four-Year Colleges		Two-Year Colleges		All Institutions	
	Public	Private	Public	Private	Public	Private	Public	Private
1964-65								
1965-66	9.7	5.6	7.6	6.2	10.1	9.4	5.8	6.1
1966-67	10.1	6.4	7.5	7.0	11.0	10.0	7.0	6.8
1967-68	1.7	5.4	3.5	6.5	19.0	5.6	2.9	5.2
1968-69	3.0	6.8	4.9	7.9	18.1	7.2	4.2	6.6
1969-70	13.3	10.4	8.9	10.0	4.7	8.2	9.5	10.8
1970-71	11.9	9.5	8.5	9.2	5.1	7.3	8.7	9.8
1971-72	10.0	7.7	6.6	7.4	2.7	5.7	7.1	8.1
1972-73	7.6	4.4	28.5	7.3	21.4	4.2	8.2	4.3
1973-74	2.7	6.7	1.8	4.3	17.6	6.7	7.6	4.8
1974-75	3.1	10.1	-3.2	1.5	1.1	4.9	-1.4	6.4
1975-76	7.2	10.2	4.7	6.7	-11.6	4.4	0.2	7.3
1976-77	7.3	5.9	20.3	12.8	15.5	11.6	10.6	8.6
1977-78	6.8	6.2	5.7	7.2	8.1	7.2	6.9	6.4
1978-79	5.6	7.6	4.4	10.0	6.9	7.3	6.1	9.3
1979-80	8.1	9.3	6.4	9.0	8.6	12.6	7.4	9.2
1980-81	8.9	12.2	9.1	12.3	10.1	17.0	8.9	11.8
1981-82	13.9	14.3	12.6	13.7	11.0	11.8	12.4	13.0
1982-83	11.7	14.2	15.1	12.4	9.0	11.5	11.8	12.3
1983-84	10.3	11.4	12.4	9.2	11.6	3.0	11.7	9.3
1984-85	7.9	10.1	6.2	8.7	10.6	12.5	9.0	9.6
1985-86	10.8	7.8	3.6	9.9	9.8	5.4	7.6	8.9
1986-87	7.5	10.1	7.9	9.4	3.0	0.3	5.8	9.1
1987-88	6.0	8.0	5.8	8.1	4.5	6.1	4.9	8.0

Source: USDE, OERI, *Digest*, 1989, pp. 281-82.
(Data for Charts 1, 3, 5, & 6)

COMPARATIVE TRENDS:
CPI, HEPI, AND COLLEGE TUITION

	CPI-U Index: 1982-84 = 100	Higher Education Price Index Index: 1983 = 100			Tuition	
AY-FY		Salary	Non-Salary	Total	Public	Private
1976-77	58.7	62.8	56.7	61.1	479	2,467
1977-78	62.6	66.8	59.9	65.2	512	2,624
1978-79	66.5	72.0	64.6	70.2	543	2,867
1979-80	77.6	78.0	74.6	77.2	583	3,130
1980-81	86.8	86.4	85.6	86.5	636	3,486
1981-82	94.1	93.7	96.0	94.0	714	3,863
1982-83	98.2	100.0	100.0	100.0	796	4,439
1983-84	101.8	106.1	102.9	105.4	891	4,851
1984-85	105.8	113.3	108.1	112.5	971	5,315
1985-86	109.8	119.5	108.0	117.4	1,045	5,789
1986-87	111.2	125.7	105.3	122.3	1,106	6,316
1987-88	115.8	131.5	109.4		1,180	6,820
1988-89	121.2	140.2	114.4			
Annual Percent Increase						
1977-78	6.6	6.4	7.5	6.7	6.9	6.4
1978-79	9.4	7.8	7.8	7.7	8.1	9.3
1979-80	13.3	8.3	15.5	10.0	7.4	9.2
1980-81	11.8	9.5	14.7	10.8	8.9	11.8
1981-82	8.7	9.7	11.0	9.9	12.4	13.0
1982-83	4.4	6.7	5.3	6.4	11.8	12.3
1983-84	3.7	6.1	2.9	5.4	11.7	9.3
1984-85	3.9	6.8	3.1	6.7	9.0	9.6
1985-86	2.8	5.5	-0.1	4.4	7.6	8.9
1986-87	2.2	5.2	-0.7	4.2	5.8	9.1
1987-88	4.1	4.6	3.9	6.2	4.9	8.0
1988-89	4.7	6.6	4.6			
Average Annual Increase						
1977-78 to 1981-82	9.9	9.4	11.3	9.0	8.3	9.9
1982-83 to 1987-88	3.5	5.8	2.4	5.5	8.5	9.5

Source: USDE, OERI, NCES, *Digest* 1989, pp. 34, 281-282.
(Data for Chart 7)

TRENDS IN TUITION COMPARED WITH THE CPI

Year-to-Year Change

	Tuition		CPI
	Public Colleges	Private Colleges	
	AY	AY	CY
1975-76	10.6	8.6	9.1
1976-77	6.9	6.4	5.8
1977-78	6.1	9.3	6.5
1978-79	7.4	9.2	7.7
1979-80	8.6	11.8	11.3
1980-81	13.9	13.6	13.5
1981-82	10.7	11.8	10.4
1982-83	11.7	9.3	5.8
1983-84	9	9.5	3.6
1984-85	7.5	8.7	4.3
1985-86	5.9	9.3	3.6
1986-87	4.9	8	1.9
1987-88			2.3

Note: AY = Academic Year; CY = Calendar Year.

Source: USDC, USDE

(Data for Chart 8)

TRENDS IN HIGHER EDUCATION COST COMPARED WITH THE CPI

	Index:			
	1983 = 100	1982-84 = 100	Annual Percent Increase:	
Academic Year	HEPI	CPI-U	HEPI	CPI-U
1960-61	25.1	29.8	4.0	1.0
1961-62	26.1	30.1	3.8	1.0
1962-63	27.1	30.4	3.7	1.3
1963-64	28.1	30.8	4.3	1.3
1964-65	29.3	31.2	5.1	2.2
1965-66	30.8	31.9	5.2	3.1
1966-67	32.4	32.9	5.9	3.3
1967-68	34.3	34.0	7.0	5.0
1968-69	36.7	35.7	6.8	5.9
1969-70	39.2	37.8	6.1	5.0
1970-71	41.6	39.7	5.8	3.8
1971-72	44.0	41.2	5.2	3.9
1972-73	46.3	42.8	7.1	8.9
1973-74	49.6	46.6	8.5	11.2
1974-75	53.8	51.8	8.7	7.1
1975-76	57.4	55.5	6.4	5.8
1976-77	61.1	58.7	6.7	6.6
1977-78	65.2	62.6	7.7	9.4
1978-79	70.2	68.5	10.0	13.3
1979-80	77.2	77.6	10.8	11.6
1980-81	86.5	86.6	9.9	8.7
1981-82	94.0	94.1	8.4	4.4
1982-83	100.0	98.2	5.4	3.7
1983-84	105.4	101.8	8.7	3.9
1984-85	112.5	105.8	4.4	2.8
1985-86	117.4	108.8	4.2	2.2
1986-87	122.3	111.2		4.1
1987-88		115.8		4.7
1988-89		121.2		

Source: USDE, OERI, NCES *Digest* 1989, (NCES 89-643), p. 38

(Data for Chart 9)

(CPI-U = Consumer Price Index for All Urban Workers)

TRENDS IN HIGHER EDUCATION COSTS BY COMPONENT

(1983 = 100)

	Personnel Compensation				Contracted Services, Supplies and Equipment						
	PS	NPWS	FB	Sub-total	Svs	Sup	Eqm	BP	Util	Sub-total	HEPI
1961	28.7	28.1	9.7	24.6	32.9	33.5	35.0	14.9	15.7	25.7	25.1
1962	30.1	28.9	10.5	25.8	33.5	33.4	35.2	15.7	15.8	26.0	26.1
1963	31.7	29.6	11.4	27.0	34.2	33.4	35.0	16.7	15.8	26.4	27.1
1964	33.1	30.3	12.5	28.3	35.0	33.6	35.7	18.0	15.7	26.8	28.1
1965	34.9	31.0	13.7	29.8	35.8	33.8	36.0	19.3	15.7	27.3	29.3
1966	36.9	31.8	15.9	31.8	36.5	34.6	36.7	20.5	15.7	27.9	30.8
1967	39.3	33.0	17.6	33.5	37.8	35.3	37.8	21.3	15.7	28.6	32.4
1968	41.8	34.7	19.5	35.8	39.2	36.0	39.0	21.9	15.8	29.4	34.3
1969	44.6	36.6	23.2	38.6	40.9	36.6	40.3	23.3	15.9	30.4	36.7
1970	47.7	38.8	25.7	41.4	42.8	37.6	41.9	25.7	16.3	31.6	39.2
1971	50.1	41.8	28.5	44.0	45.1	39.0	43.5	30.8	18.0	33.9	41.6
1972	52.0	44.9	31.7	46.4	47.8	39.8	45.1	34.9	19.2	35.9	44.0
1973	54.3	47.6	34.8	49.0	49.0	41.1	46.5	37.7	20.2	37.6	46.3
1974	57.2	50.6	39.0	52.1	52.2	46.5	49.4	41.6	24.8	41.3	49.6
1975	60.3	54.6	42.4	55.5	56.8	58.0	58.3	46.7	31.8	48.3	53.8
1976	63.4	59.1	46.9	59.2	58.5	60.7	61.7	53.6	34.4	51.5	57.4
1977	66.4	63.2	51.9	62.8	63.0	63.8	64.8	57.0	40.5	55.7	61.1
1978	69.8	68.1	57.0	66.8	66.6	66.6	69.3	61.0	45.9	59.9	65.2
1979	74.1	73.5	64.6	72.0	70.6	71.7	74.7	67.3	50.3	64.6	70.2
1980	79.3	80.2	72.0	78.0	76.3	84.6	81.6	77.5	64.1	74.6	77.2
1981	86.3	87.7	80.9	85.4	85.1	95.6	89.6	86.2	79.7	85.6	85.5
1982	93.7	94.6	92.9	93.7	94.7	100.4	98.4	94.4	92.4	96.0	94.0
1983	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1984	104.7	105.1	111.3	106.1	104.7	103.1	102.2	103.6	100.8	102.9	105.4
1985	111.4	109.1	122.4	113.3	109.3	105.4	104.8	107.5	103.0	106.1	111.6
1986	118.2	113.0	129.0	119.5	114.4	104.2	106.9	112.6	95.5	106.0	116.3
1987	125.1	116.2	136.9	125.7	118.1	103.5	108.8	123.6	84.4	105.3	120.9
	Percent Increase										
1975 1982	55.4	73.3	119.1	68.8	66.7	73.1	65.4	102.1	190.6	98.7	74.7
1982-1988	48.3	32.8	68.5	49.6	36.4	16.4	20.1	52.6	-7.8	20.4	42.7

Source: Kent Halstead, Higher Education Price Indexes: 1989 Update, Research Associates.
(Data for Charts 10, 11, and 12)

HIGHER EDUCATION PRICE INDEX

Year-to-Year Increases

1961-1987

	Personnel Compensation				Contracted Services, Supplies and Equipment						
	PS	NPWS	FB	Sub-total	Svs	Sup	Eqm	BP	Util	Sub-total	HEPI
1962	4.9	2.8	8.2	4.9	1.8	-0.3	0.6	5.4	0.6	1.2	4.0
1963	5.3	2.4	8.6	4.7	2.1	0.0	-0.6	6.4	0.0	1.5	3.8
1964	4.4	2.4	9.6	4.8	2.3	0.6	2.0	7.8	-0.6	1.5	3.7
1965	5.4	2.3	9.6	5.3	2.3	0.6	0.8	7.2	0.0	1.9	4.3
1966	5.7	2.6	16.1	6.0	2.0	2.4	1.9	6.2	0.0	2.2	5.1
1967	6.5	3.8	10.7	6.0	3.6	2.0	3.0	3.9	0.0	2.5	5.2
1968	6.4	5.2	10.8	6.9	3.7	2.0	3.2	2.8	0.6	2.8	5.9
1969	6.7	5.5	19.0	7.8	4.3	1.7	3.3	6.4	0.6	3.4	7.0
1970	7.0	6.0	10.8	7.3	4.6	2.7	4.0	10.3	2.5	3.9	6.8
1971	5.0	7.7	10.9	6.3	5.4	3.7	3.8	19.8	10.4	7.3	6.1
1972	3.8	7.4	11.2	5.5	6.0	2.1	3.7	13.3	6.7	5.9	5.8
1973	4.4	6.0	9.8	5.6	2.5	3.3	3.1	8.0	5.2	4.7	5.2
1974	5.3	6.3	12.1	6.3	6.5	13.1	6.2	10.3	22.8	9.8	7.1
1975	5.4	7.9	8.7	6.5	8.8	24.7	18.0	12.3	28.2	16.9	8.5
1976	5.1	8.2	10.6	6.7	4.8	4.7	5.8	14.8	8.2	6.6	6.7
1977	4.7	8.9	10.7	6.1	5.9	5.1	5.0	6.3	17.7	8.2	6.4
1978	5.1	7.8	9.8	6.4	5.7	4.4	6.9	7.0	13.3	7.5	6.7
1979	6.2	7.9	13.3	7.8	6.0	7.7	7.8	10.3	9.6	7.9	7.7
1980	7.0	9.1	11.5	8.3	8.1	18.0	9.2	15.2	27.4	15.5	10.0
1981	8.8	9.4	12.4	9.5	11.5	13.0	9.8	9.9	24.3	14.7	10.8
1982	8.6	7.9	14.8	9.7	11.3	5.0	7.6	10.8	15.9	11.0	9.9
1983	6.7	5.7	7.6	6.7	5.6	-0.4	3.7	5.9	8.2	5.3	6.4
1984	4.7	5.1	11.3	6.1	4.7	3.1	2.2	3.6	0.8	2.9	5.4
1985	6.4	3.8	10.0	6.8	4.4	2.2	2.5	3.8	2.2	3.1	5.9
1986	6.1	3.6	5.4	5.5	4.7	-1.1	2.0	4.7	-7.3	-0.1	4.2
1987	5.8	2.8	6.3	5.2	3.2	-0.7	1.8	9.8	-11.6	-0.7	4.0
1988	4.7	3.5	5.1	4.6	3.6	4.3	1.9	11.7	0.0	3.9	4.5

Source: Kent Halstead, Higher Education Price Indexes: 1989 Update, Research Associates.
(Data for Chart 13)

TRENDS IN NUMBERS OF BACCALAUREATE DEGREES AWARDED

Major Fields	1979-80	1986-87	Change: 1986-87/ 1980-81	Percent of Change	Percent Change
Total, All Fields	929,417	991,339	61,922	100.0	6.7
Business and Management	185,361	241,156	55,795	90.1	30.1
Computer and Information Sciences	11,154	39,664	28,510	46.0	255.6
Communications	26,927	43,969	17,042	27.5	63.3
Engineering	58,402	73,797	15,395	24.9	26.4
Engineering Technologies	10,491	19,277	8,786	14.2	83.7
Mathematics	11,378	16,489	5,111	8.3	44.9
Letters	33,497	37,133	3,636	5.9	10.9
Multi / Interdisciplinary Studies	14,404	16,402	1,998	3.2	13.9
Liberal/General Studies	20,089	21,385	1,296	2.1	6.5
Psychology	41,962	42,868	906	1.5	2.2
Area / Ethnic Studies	2,840	3,340	500	0.8	17.6
Law	683	1,178	495	0.8	72.5
Military Sciences	251	383	132	0.2	52.6
Architecture and Environmental Desi	9,132	8,922	(210)	-0.3	-2.3
Communications Technologies	1,689	1,439	(250)	-0.4	-14.8
Library / Archival Sciences	398	139	(259)	-0.4	-65.1
Health Sciences	63,607	63,206	(401)	-0.6	-0.6
Theology	6,207	5,710	(497)	-0.8	-8.0
Foreign Languages	11,133	10,184	(949)	-1.5	-8.5
Philosophy and Religion	7,069	5,976	(1,093)	-1.8	-15.5
Parks and Recreation	5,753	4,107	(1,646)	-2.7	-28.6
Protective Services	15,015	12,930	(2,085)	-3.4	-13.9
Physical Sciences	23,410	19,974	(3,436)	-5.5	-14.7
Home Economics	18,411	14,942	(3,469)	-5.6	-18.8
Public Affairs	18,422	14,161	(4,261)	-6.9	-23.1
Visual and Performing Arts	40,892	36,223	(4,669)	-7.5	-11.4
Social Sciences	103,519	96,185	(7,334)	-11.8	-7.1
Agriculture and Natural Resources	22,802	14,991	(7,811)	-12.6	-34.3
Life Sciences	46,370	38,114	(8,256)	-13.3	-17.8
Education	118,169	87,115	(31,054)	-50.2	-26.3

Source: USDE, OERI, *Digest*, 1989, p. 233.
(Data for Chart 14)

TRENDS IN THE PHYSICAL ASSETS OF COLLEGES AND UNIVERSITIES
(Millions of Dollars)

	Land	Buildings	Equipment	Debt *
1970-71	3,118	35,043	7,893	9,786
1971-72	3,287	38,131	8,735	10,291
1972-73	3,493	40,808	9,514	10,824
1973-74	3,888	43,701	10,413	11,401
1974-75	4,211	46,454	11,519	12,413
1975-76	4,345	49,349	12,654	12,687
1976-77	4,445	52,384	13,910	13,068
1977-78	4,621	55,189	14,961	13,438
1978-79	4,824	57,563	16,251	13,713
1979-80	5,037	60,847	17,849	14,182
1980-81	5,212	64,158	19,390	14,795
1981-82	5,402	67,795	21,319	15,488
1982-83	5,889	71,520	23,584	16,750
1983-84	6,110	75,221	26,310	18,227
1984-85	6,236	79,134	29,394	22,106
1985-86	6,574	82,886	32,801	25,699
Percent Increase:				
1973-74 to 1979-80	29.6	39.2	71.4	29.8
1979-80 to 1985-86	30.5	36.2	83.8	73.7

Note: * Debt is liabilities of plant funds.

Source: USDE, OERI, NCES, *Digest*, 1989, p. 315.
(Data for Chart 15)

CUMULATIVE LAG IN THE PURCHASING POWER OF FACULTY SALARIES

	Faculty Salaries		Consumer Price Index				Cumulative Lag in Purchasing Power	
	FY Index 1967=100	Annual Percent Change	CY Index 1967=100	FY Index 1971=100	Annual Percent Change	Difference in Annual Rates of Change	From 1961	From 1971
1961	28.7		30.1				0.0	-21.7
1962	30.1	4.9	30.4		1.0	3.9	3.8	-18.6
1963	31.7	5.3	30.8		1.3	4.0	7.9	-15.4
1964	33.1	4.4	31.2		1.3	3.1	11.3	-12.8
1965	34.9	5.4	31.9		2.2	3.2	14.7	-10.0
1966	36.9	5.7	32.9		3.1	2.6	17.6	-7.8
1967	39.3	6.5	34.0		3.3	3.2	21.2	-4.9
1968	41.8	6.7	35.7		5.0	1.7	22.8	-3.7
1969	44.6	7.0	37.8		5.9	1.1	23.7	-3.0
1970	47.7	5.0	39.7		5.0	0.0	26.0	-1.2
1971	50.1	3.8	41.2		3.8	0.0	27.5	0.0
1972	52.0	4.4	42.8		3.9	0.5	27.4	-0.1
1973	54.3	5.3	46.6		8.9	-3.6	22.2	-4.2
1974	57.2	5.4	51.8		11.2	-5.8	15.8	-9.2
1975	60.3	5.1	55.5		7.1	-2.0	13.9	-10.7
1976	63.4	4.7	58.7		5.8	-1.1	13.3	-11.2
1977	66.4	5.1	62.6		6.6	-1.5	11.2	-12.8
1978	69.8	6.2	68.5		9.4	-3.2	6.9	-16.2
1979	74.1	7.0	77.6		13.3	-6.3	0.1	-21.5
1980	79.3	8.8	86.6		11.6	-2.8	-4.0	-24.7
1981	86.3	8.6	94.1		8.7	-0.1	-3.8	-24.6
1982	93.7	6.7	98.2		4.4	2.3	0.1	-21.5
1983	100.0	4.7	101.8		3.7	1.0	3.0	-19.2
1984	104.7	6.4	105.8		3.9	2.5	3.8	-18.6
1985	111.4	6.1	108.8		2.6	3.3	7.4	-15.8
1986	118.2	5.8	111.2		2.2	3.6	11.5	-12.6
1987	125.1	4.7	115.8		4.1	0.6	13.3	-11.2
1988	131.0		121.2		4.7			
1989	139.0							

Sources: U.S. Department of Labor (USDL); HEPI
(Data for Charts 16, 17, & 18)

TRENDS IN TEACHER SALARIES COMPARED WITH THE AVERAGE ANNUAL SALARIES OF SELECTED WHITE-COLLAR OCCUPATIONS
(1989 DOLLARS)

Year	Average Teacher Salary	Account-ant III	Auditor III	Attorney III	Chemist IV	Engineer IV	Full Professor Public Doctoral	Assistant Professor Public Compre-hensive
1962	22.953	30.865	33.013	49.295	41.354	42.652		
1963	23.471	31.398	33.756	50.364	41.962	43.928	48.317	30.710
1964	24.311	32.069	34.551	51.973	43.116	44.673	50.691	31.226
1965	24.649	32.324	34.806	54.286	43.687	45.263	52.520	31.432
1966	24.940	32.027	34.243	54.040	44.026	45.318	54.225	31.920
1967	25.492	33.139	35.267	53.816	44.952	46.370	55.985	32.098
1968	26.456	33.385	35.559	54.470	45.446	46.672	57.382	33.859
1969	26.688	33.658	36.998	53.292	44.834	46.626	57.389	33.897
1970	27.451	33.971	36.479	53.675	45.199	46.716	57.540	34.333
1971	28.534	35.042	37.640	53.901	46.288	47.824	59.107	35.096
1972	28.892	35.364	38.347	54.754	46.651	48.106	58.946	35.129
1973	27.868	34.158	37.158	53.581	44.202	46.639	56.142	34.233
1974	26.275	32.387	34.961	51.395	42.134	43.708	52.658	31.936
1975	26.650	32.960	34.967	51.426	43.780	44.325	51.750	31.688
1976	27.372	33.540	34.912	52.621	44.412	45.108	52.610	31.740
1977	27.204	33.709	34.857	51.873	44.159	44.970	51.343	31.988
1978	26.552	33.855	35.053	51.840	43.979	44.801	49.339	29.716
1979	24.695	32.115	33.492	48.901	41.997	42.872	46.519	27.384
1980	23.604	31.227	32.292	48.431	40.583	41.764	44.130	26.097
1981	23.372	31.692	32.844	48.958	41.458	42.200	44.284	25.978
1982	24.560	33.282	34.356	51.399	44.137	44.651	46.280	26.964
1983	25.689	34.189	35.313	52.849	44.308	45.917	47.759	27.505
1984	26.403	34.510	36.298	53.762	45.231	46.867	47.822	27.636
1985	27.287	34.771	36.170	55.266	45.630	47.451	49.313	28.245
1986	28.923	35.659	36.779	57.387	47.573	48.855	52.213	29.771
1987	29.181	35.168	36.512	57.186	47.672	48.636	53.439	30.173
1988	29.475	34.679	36.503	58.177	48.048	47.964	53.634	29.799
1989	29.629						54.240	30.900

Sources: USDL *Handbook of Labor Statistics* (1985); USDL National "Survey of Professional, Administrative,Technical and Clerical Pay" (1985 and 1989); AAUP
(Data for Chart 19)

COMPARATIVE INCOME TRENDS

Salary of
University Professors at Comprehensive Universities
Compared with
Doctors

AY-FY	University Professors: Public University	University Professors: Private University	Doctors: Independent Practitioners
1970-71	19.150	21.080	41.800
1971-72	19.820	21.850	45.300
1972-73	20.470	22.500	47.200
1973-74	21.581	23.602	48.600
1974-75	22.680	24.970	52.000
1975-76	24.150	26.540	56.400
1976-77	25.210	27.810	59.500
1977-78	26.420	28.880	61.200
1978-79	28.190	31.100	65.500
1979-80	30.120	33.400	78.400
1980-81	32.850	36.000	80.900
1981-82	32.680	40.220	93.000
1982-83	38.180	43.950	99.500
1983-84	39.770	47.070	106.300
1984-85	42.560	49.880	108.400
1985-86	45.560	53.190	113.200
1986-87	48.740	56.900	
1987-88	51.080	59.850	
1988-89	54.690	64.970	

Sources: AAUP; American Medical Association (AMA)
(Data for Charts 20 & 21)

COMPARATIVE INCOME TRENDS

Salary of
Assistant Professors at Public Comprehensive Universities
Compared With
Median Family Income

AY-FY	Assistant Professor at a Public Comprehensive University	Median Family Income	Ratio
1970-71	$ 11.440	$ 9.867	1.16
1971-72	11.800	10.285	1.15
1972-73	12.470	11.116	1.12
1973-74	13.120	12.051	1.09
1974-75	13.920	12.902	1.08
1975-76	14.570	13.719	1.06
1976-77	15.060	14.958	1.01
1977-78	15.860	16.009	0.99
1978-79	16.590	17.640	0.94
1979-80	17.790	19.587	0.91
1980-81	19.280	21.023	0.92
1981-82	20.770	22.388	0.93
1982-83	22.040	23.433	0.94
1983-84	23.040	24.674	0.93
1984-85	24.420	26.433	0.92
1985-86	25.950	27.735	0.94
1986-87	27.520	29.458	0.93
1987-88	28.360	30.853	0.92
1988-89	31.610		

Sources: AAUP, USDC
(Data for Charts 22 & 23)

TRENDS IN STUDENT/FACULTY RATIO AND THE PART-TIME FACULTY AS A PERCENT OF THE TOTAL

Year	All Institutions	Public Colleges	Private Colleges	Part-Time Faculty as a Percent of the Total
1970	16.0	18.5	13.2	21.9
1971	16.4	19.0	13.4	23.0
1972	16.5	18.9	13.7	24.0
1973	16.3	18.7	13.6	26.2
1974	16.0	18.5	13.5	28.4
1975	15.9	18.4	13.2	29.9
1976	15.6	17.9	13.6	31.4
1977	14.9	16.9	14.0	33.9
1978				
1979	15.2	17.0	14.5	34.1
1980	15.5	17.4	14.8	34.4
1981	15.5	17.3	14.8	34.6
1982	15.5			34.9
1983	15.3	17.5	14.0	35.1
1984	15.2			35.6
1985	15.2	17.5	14.2	35.8
1986	15.3	17.6	14.3	36.4
1987	15.4			36.5
1988				37.1

Note: Student/Faculty Ratio is FTE Enrollment/FTE Faculty. FTE Faculty=FT + PT/2
Source: USDE, OERI, NCES, *Digest*, 1989, pp. 281-82.
(Data for Charts 24 & 25)

RELATIONSHIP BETWEEN INCREASES IN STATE COLLEGE TUITION AND STATE APPROPRIATIONS FOR STATE COLLEGES

	State Appropriations (Millions)	Annual Percent Increase	
		State Appropriations	State College Tuition
1973	8.512		
1974	9.830	15.5	4.1
1975	10.963	11.5	3.7
1976	12.575	14.7	5.6
1977	13.863	10.2	5.6
1978	15.436	11.3	6.6
1979	16.976	10.0	5.4
1980	19.061	12.3	6.7
1981	20.940	9.9	7.1
1982	22.752	8.7	16.8
1983	23.926	5.2	12.0
1984	25.506	6.6	10.8
1985	28.364	11.2	7.4
1986	30.730	8.3	7.0
1987	32.367	5.3	7.5
1988	34.042	5.2	7.0
1989 p	32.367		
1990 p	34.042		

Source: John R. Wittstruck and Stephen M. Bragg, *Focus on Price: Trends in Public Higher Education*. Denber: State Higher Education Executive Officers (1988).
(Data for Chart 27)

TRENDS IN CURRENT FUND REVENUES
(Millions of Dollars)

	1979-80	1985-86	Increase		
			Dollar	Distribution	Percent
All Institutions					
Total Current Fund Revenue	58.520	100.437	41.917	100.0	71.6
Private Sources:	30.783	55.277	24.494	58.4	79.6
Tuition and Fees	11.930	23.117	11.187	26.7	93.8
Private Gifts, Grants, and Contracts	2.808	5.411	2.603	6.2	92.7
Endowment Income	1.177	2.276	1.099	2.6	93.4
Sales and Services, Other Services, Independent Operations	14.868	24.473	9.605	22.9	64.6
Public Sources:	27.737	45.161	17.424	41.6	62.8
Government Appropriations, Grants, Contracts					
Federal	7.771	12.705	4.934	11.8	63.5
State	18.379	29.911	11.532	27.5	62.7
Local	1.587	2.545	958	2.3	60.4

Source: USDE, OERI, NCES, *Digest* (1988).
(Data for Chart 30)

TRENDS IN CURRENT FUND REVENUES

Percent Distribution

	1980-81	1985-86
All Institutions		
Total Current Fund Revenue	100.0	100.0
Tuition and Fees	20.4	23.0
Government Appropriations, Grants and Contracts		
Federal	13.3	12.6
State	31.4	29.8
Local	2.7	2.5
Private Gifts, Grants, and Contracts	4.8	5.4
Endowment Income	2.0	2.3
Sales and Services, Other Services, and Independent Operations	25.4	24.4

TRENDS IN CURRENT FUND REVENUES
(Millions of Dolars)

	1980-81	1985-86	Increase Dollar	Increase Percent	Distribution
Public Institutions					
Total Current Fund Revenue	38.824	66.878	28.054	72.3	100.0
Tuition and Fees	4.860	9.439	4.579	94.2	16.3
Government Appropriations, Grants and Contracts					
Federal	5.013	8.573	3.560	71.0	12.7
State	17.973	29.221	11.248	62.6	40.1
Local	1.436	2.325	889	61.9	3.2
Private Gifts, Grants, and Contracts	979	2.110	1.131	115.5	4.0
Endowment Income	191	399	208	108.9	0.7
Sales and Services, Other Services, and Independent Operations	8.372	14.811	6.439	76.9	23.0
Private Institutions					
Total Current Fund Revenue	19.696	36.125	16.429	83.4	100.0
Tuition and Fees	7.070	13.678	6.608	93.5	40.2
Government Appropriations, Grants and Contracts					
Federal	2.760	4.458	1.698	61.5	10.3
State	404	691	287	71.0	1.7
Local	151	219	68	45.0	0.4
Private Gifts, Grants, and Contracts	1.829	3.301	1.472	80.5	9.0
Endowment Income	968	1.877	891	90.4	5.4
Sales and Services, Other Services, and Independent Operations	6.496	11.901	5.405	83.2	32.9

PRIVATE SHARE OF ADDED REVENUES
Increase in Revenues from 1980-81 to 1985-86

	(Millions)	Percent
Private Institutions		
Total Increase in Current Fund Revenues:	16.429	100.0
Private Share:	14.378	87.5
Tuition and Fees	6.608	40.2
Private Gifts	1.472	9.0
Endowment Income	891	5.4
Sales and Services	5.405	32.9
Public Share:	2.053	12.5
Federal	1.698	10.3
State	287	1.7
Local	68	0.4
Public Institutions		
Total Increase in Current Fund Revenues:	28.054	100.0
Private Share:	12.357	44.0
Tuition and Fees	4.579	16.3
Private Gifts	1.131	4.0
Endowment Income	208	0.7
Sales and Services	6.439	23.0
Public Share:	15.697	56.0
Federal	3.560	12.7
State	11.248	40.1
Local	889	3.2

Source: USDE, NCES

CURRENT FUND EXPENDITURES PER STUDENT COMPARED WITH STATE APPROPRIATIONS AND TUITION

Public Institutions

				Year-to-Year Percent Change:		
	Real CFE/ Student	Real State Appropriations Per Student	Public Tuition	Real CFE/ Student	Real State Appropriations Per Student	Tuition
1970-71	$8,534		351			
1971-72	$8,233		376	-3.5		7.1
1972-73	$8,463	$3,833	407	2.8		8.2
1973-74	$8,553	$3,914	438	1.1	2.1	7.6
1974-75	$8,618	$3,668	432	0.8	-6.3	-1.4
1975-76	$8,213	$4,051	433	-4.7	10.4	0.2
1976-77	$8,663	$4,162	479	5.5	2.7	10.6
1977-78	$8,650	$4,425	512	-0.2	6.3	6.9
1978-79	$8,978	$4,437	543	3.8	0.3	6.1
1979-80	$8,991	$4,242	583	0.1	-4.4	7.4
1980-81	$8,743	$4,146	635	-2.8	-2.3	8.9
1981-82	$8,508	$4,082	714	-2.7	-1.5	12.4
1982-83	$8,495	$4,251	798	-0.2	4.1	11.8
1983-84	$8,594	$4,440	891	1.2	4.4	11.7
1984-85	$9,102	$4,530	971	5.9	2.0	9.0
1985-86	$9,471		1045	4.1		7.6
1986-87			1106			5.8
1987-88			1160			4.9
1988-89						

Source: USDE, OERI, NCES: *Digest,* 1989, p.300
(Data for Chart 31)

TRENDS IN STUDENT AID BY SECTOR

Year	Total Federal Student Aid	Federal Grant Programs	Federal Loan Programs	State Grant Programs	Institutionally Awarded Aid
1963-64	190	76	114	56	300
1970-71	3.295	1.997	1.298	236	965
1971-72	3.940	2.303	1.637	269	1.088
1972-73	4.730	3.104	1.626	315	1.149
1973-74	5.248	3.613	1.634	364	1.207
1974-75	7.009	5.214	1.797	422	1.249
1975-76	8.599	6.828	1.772	490	1.435
1976-77	8.484	6.553	1.932	608	1.526
1977-78	8.949	6.556	2.394	677	1.596
1978-79	9.357	6.310	3.046	726	1.678
1979-80	11.701	7.088	4.614	788	1.888
1980-81	14.371	7.413	6.959	801	2.060
1981-82	14.964	7.053	7.912	921	2.247
1982-83	13.407	5.897	7.510	1.006	2.507
1983-84	14.152	5.630	8.521	1.106	2.881
1984-85	15.175	5.562	9.612	1.222	3.221
1985-86	15.886	5.972	9.914	1.311	3.674
1986-87	15.942	5.765	10.178	1.432	4.056
1987-88	18.441	6.080	12.356	1.540	4.565
Change: 1980-81 to 1987-88					
Dollar:	4.070	(1.333)	5.397	739	2.505
Percent:	28.3	-18.0	77.6	92.3	121.6

Source: Trends in Student Aid (annual editions). New York: The College Board.
(Data for Charts 32 and 33)

ESTIMATED IMPACT OF INSTITUTIONALLY FUNDED STUDENT AID ON PRIVATE COLLEGE TUITION

Year	Gross Tuition	Scholarship and Fellowship Unrestricted	Net Tuition	Total FTE Enrollment	Aided Students	Net Tuition Per Student	Student Aid Per Aided Student	ISFA as a Percent of Net Tuition Revenue Per Student
	Millions	Millions	Millions	Thousands	Thousands			
1975-76	4.693	410	4.283	1.957	979	2.189	419	19.1
1977-78	5.713	513	5.200	2.019	1.010	2.576	508	19.7
1979-80	7.071	581	6.490	2.095	1.048	3.098	555	17.9
1980-81	8.203	713	7.490	2.177	1.089	3.441	655	19.0
1981-82	9.379	861	8.518	2.233	1.117	3.815	771	20.2
1982-83	10.480	1.018	9.462	2.241	1.121	4.222	909	21.5
1983-84	11.592	1.220	10.372	2.285	1.143	4.539	1.068	23.5
1984-85	12.636	1.393	11.243	2.267	1.134	4.959	1.229	24.8
1985-86	13.677	1.588	12.089	2.276	1.138	5.312	1.395	26.3

Note: Scholarships and fellowships totaled $2.584 million in private institutions in 1985-86 including $996 million from restricted funds and $1.588 million from unrestricted funds. Only unrestricted funds were chacterized as institutionally funded student aid.

Source: USDE, OERI, NCES, *Digest* (1988), pp. 151, 256, 260.
(Data for Chart 34)

TRENDS IN FUNDING OF R&D AT UNIVERSITIES AND COLLEGES (Millions of Current Dollars)

Fiscal Year	Total	Federal Government	State and Local Government	Industry	Institutional Funds	Other
1953	255	138	37	19	35	26
1954	290	160	42	22	38	28
1955	312	169	47	25	41	30
1956	372	213	53	29	43	34
1957	410	229	60	34	49	38
1958	456	254	68	39	53	42
1959	526	306	76	39	58	47
1960	646	405	85	40	64	52
1961	763	500	95	40	70	58
1962	904	613	106	40	79	66
1963	1.081	760	118	41	89	73
1964	1.275	917	132	40	103	83
1965	1.474	1.073	143	41	124	93
1966	1.715	1.261	156	42	148	108
1967	1.921	1.409	164	48	181	119
1968	2.149	1.572	172	55	218	131
1969	2.225	1.600	197	60	223	145
1970	2.335	1.648	219	61	243	165
1971	2.500	1.724	255	70	274	177
1972	2.630	1.795	269	74	305	187
1973	2.884	1.985	295	84	318	202
1974	3.023	2.032	308	96	368	218
1975	3.409	2.288	332	113	417	259
1976	3.729	2.512	364	123	446	284
1977	4.067	2.726	374	139	514	314
1978	4.625	3.059	414	170	623	359
1979	5.361	3.595	470	194	728	374
1980	6.081	4.096	491	238	827	401
1981	6.845	4.561	544	293	972	436
1982	7.324	4.759	609	339	1.078	491
1983	7.883	4.980	624	388	1.256	579
1984	8.623	5.425	683	474	1.350	617
1985	9.694	6.084	729	559	1.557	694
1986	10.926	6.713	911	692	1.877	732
1987	12.082	7.326	1.019	777	2.126	834
1988	13.000	7.800		850		880
1989	13.900	8.250		920		930

Source: NSF
(Data for Charts 35 & 36)

TRENDS IN COLLEGE AND UNIVERSITY ENDOWMENTS

	Endowment End of Year Market Value	Adjusted by HEPI		Real Endowment	FTE Enrollment	Real Endowment per Student
	(Millions of Dollars)	1967=100	1985-86=100	(Millions of Dollars)	(Thousands)	
					6.738	
1970-71	13.714	128.6	35.5	38.657	7.149	5.407
1971-72	15.181	135.8	37.5	40.524	7.254	5.586
1972-73	15.100	143.0	39.4	38.278	7.453	5.136
1973-74	13.168	153.1	42.2	31.178	7.805	3.995
1974-75	14.385	166.2	45.8	31.332	8.480	3.695
1975-76	15.488	177.2	48.9	31.684	8.313	3.811
1976-77	16.305	188.7	52.1	31.323	8.415	3.722
1977-78	16.840	201.3	55.5	30.325	8.348	3.633
1978-79	18.159	216.6	59.8	30.391	8.487	3.581
1979-80	20.743	238.2	65.7	31.567	8.819	3.579
1980-81	23.465	263.9	72.8	32.232	9.015	3.575
1981-82	24.415	290.4	80.1	30.477	9.092	3.352
1982-83	32.691	308.8	85.2	38.376	9.166	4.187
1983-84	32.976	325.4	89.8	36.736	8.952	4.104
1984-85	39.916	347.3	95.8	41.663	8.943	4.659
1985-86	50.281	362.5	100.0	50.281	9.060	5.550
		377.6				

Sources: USDE, OERI, NCES, *Digest*, 1989, p. 280.
(Data for Charts 41 & 42)

TRENDS IN TOTAL ENROLLMENT IN HIGHER EDUCATION

(Head Count)
(Thousands)

AY		
1957		3.324
1958		
1959		3.640
1960		
1961		4.145
1962		
1963		4.780
1964		5.280
1965		5.921
1966		6.390
1967		6.912
1968		7.513
1969		8.005
1970		8.581
1971		8.949
1972		9.215
1973		9.602
1974		10.224
1975		11.185
1976		11.012
1977		11.286
1978		11.260
1979		11.570
1980		12.097
1981		12.372
1982		12.426
1983		12.465
1984		12.242
1985		12.247
1986		12.505
1987	p	12.768
1988	p	13.043
1989	p	13.487

Source: USDE, OERI, NCES, *Digest*, 1989, and unpublished data
(Data for Chart 44)

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February 1990 • Code 291